

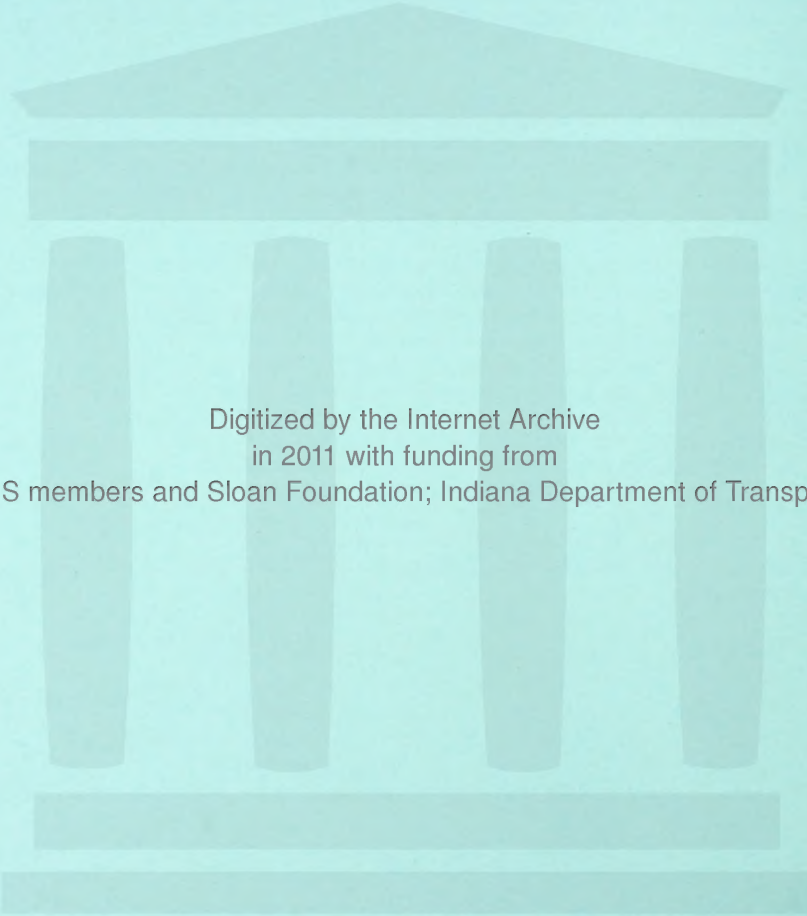
TRAFFIC SPEED REPORT  
NO. 74

NOVEMBER, 1961  
NO. 28

Joint  
Highway  
Research  
Project

PURDUE UNIVERSITY  
LAFAYETTE INDIANA

by  
K. J. THARP  
D. F. PETTY



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Progress Report

TRAFFIC SPEED REPORT NO. 74

TO: K. B. Woods, Director  
Joint Highway Research Project

November 8, 1961

FROM: H. L. Michael, Associate Director  
Joint Highway Research Project

File: 8-3-3  
Project: C-36-10C

A copy of Traffic Speed Report No. 74 is attached. This report covers the summer, semi-annual speed study of free-flowing rural traffic on state highways in the vicinity of Lafayette, Indiana. These studies have been in progress for over 20 years and provide data on the trend of rural vehicular speeds in Indiana.

This report is similar to the previous ones but also reports two important changes in this long-term trend study. Interstate highways have been added as a separate classification to the study and 2-lane and non-interstate 4-lane highways have been retained as other classifications. Statistical analysis has also been used more extensively in this study and the results include information on the variability of the data as well as the averages previously reported. In this connection, four stations were selected as the most desirable number of locations for each classification. Two stations on non-interstate 4-lane highways were, therefore, also added to the study.

The report is submitted for the record and for release to the Bureau of Public Roads, the Indiana State Police and the Office of Traffic Safety.

Respectfully submitted,

*Harold L. Michael*

Harold L. Michael  
Secretary

HLM:kmc

Attachment

cc: F. L. Ashbaucher  
J. R. Cooper  
W. L. Dolch  
W. H. Goetz  
F. F. Havey  
F. S. Hill  
G. A. Leonards

J. F. McLaughlin  
R. D. Miles  
R. E. Mills  
M. B. Scott  
J. V. Smythe  
J. L. Walling  
E. J. Yoder



Progress Report

TRAFFIC SPEED REPORT NO. 74

by

K. J. Tharp  
and  
D. F. Petty  
Research Assistants

Joint Highway Research Project  
File: 8-3-3  
Project: C-36-10C

Purdue University  
Lafayette, Indiana

November 8, 1961



## TRAFFIC SPEED REPORT NO. 74

### Introduction

This report is an analysis of spot-speed observations made in June, July, and August 1961. All observations were made of free-moving vehicles on level, tangent sections of rural highways during daylight hours and under favorable weather conditions. Speeds were recorded to the nearest mile per hour.

Because Interstate highways are becoming a vital portion of the highway system in Indiana, they have been added to the scope of the study. Thus, data were collected for three classifications of highway - two lane, four lane and Interstate.

A review of the previous Traffic Speed Reports also formed the basis for a revision of the study. This revision was made to provide for a better statistical analysis of the data collected on the highways. The earlier reports indicated that four stations in each classification would provide a reasonable estimate of average speeds at a moderate cost. To comply with this evidence the stations on four-lane highways were increased to four; four stations were selected on Interstate highways; and the previous four stations on two-lane highways were retained.

The amount of data collected at each station was reduced considerably. The data from the previous studies indicated that 215 observations would allow an estimation of the average passenger car speed within plus or minus one mile per hour at a confidence level of 95%. Similarly, 35 observations of heavy trucks would permit an





estimation of average truck speed within plus or minus two miles per hour at a confidence level of 90%. These minimum sample sizes were adopted for this and future studies and consequently the average speeds recorded at the stations are estimates, with possible error and confidence as noted, of the true average speeds at those locations under the conditions existing at the time of observation.

#### Locations of Speed Stations

The following speed stations were used in this study.

##### Interstate Highways

1. I-80 0.7 mile east of junction of SR 912
2. I-65 1.0 mile north of junction of SR 334
3. I-74 1.0 mile east of junction of Post Road
4. I-65 2.9 mile north of junction of SR 160

##### 4-Lane Highways

5. US 31 1.2 mile south of SR 38
- \*6. US 52 1.0 mile south of south junction of SR 28
7. US 41 1.0 mile north of south junction of SR 2
- \*8. US 52 1.0 mile north of Klondyke

##### 2-Lane Highways

- \*9. US 41 1.0 mile north of Boswell
- \*10. US 52 2.0 mile north of Templeton
- \*11. US 31 3.0 mile south of Rochester
- \*12. SR 25 0.7 mile west of Americus

\*indicates stations used in previous studies.



### Equipment and Field Procedure

The data for this study were obtained by using an Electromatic Radar Speed Meter. The meter was placed approximately two feet from the edge of the pavement at an angle of less than  $10^{\circ}$  with the highway centerline. Speed inaccuracies are negligible at small angles, and corrections were unnecessary.

Since the radar equipment will not operate properly if the voltage varies more than plus one volt or minus one-half volt from the optimum twelve volts, the battery voltage was checked periodically and maintained in the proper range. Also, the meter was periodically checked with a 60 mile per hour tuning fork to maintain the correct calibration.

The observers and equipment were concealed from traffic as much as local conditions permitted in order to minimize their effect upon vehicle speed.

### Procedure and Analysis

The field data for each station are listed in Tables 1 through 12, inclusive. Tables 13, 14, 15, and 16 are summaries of the interstate, four lane, two lane and all highways, respectively. Figures 1 through 16, inclusive, are cumulative frequency curves computed and drawn from the corresponding tables.

Trucks have been grouped into a "light" (less than 5,000 pounds gross weight) or "heavy" (more than 5,000 pounds gross weight) classification in order to compare observed speeds with legal speeds. Speed limits in the state of Indiana are: 65 miles per hour for passenger cars and light trucks; 55 miles per hour for heavy trucks



on four lane highways with a median width of 20 feet or more, and 50 miles per hour for heavy trucks on other highways. All four lane highways covered in this study have at least 20 foot wide medians.

Passenger car data/classified into three groups - Indiana, out-of-state, and all passenger cars. Incomplete data, however, were obtained at station 4 because of its distance from Lafayette and the time available to obtain speeds at this site, only data for passenger cars without classification as to in or out-of-state and trucks were obtained at this site.

#### Summary of Results

The summary of spot-speed observations is recorded in Table 17. The mean speed of passenger cars appears to have become nearly stabilized over the past five years. The graphical presentation (Figure 17) of rural speeds show that the variations obtained by different studies during this period of time have been minor. The 85th percentile speed also shows a trend towards becoming stable - at a value slightly below the 65 mile per hour speed limit.

However, since 1954 the mean truck speed appears to be slowly increasing (Figure 17). Figure 18 indicates that this upward trend in truck speeds also applies to the 15th percentile, and results in a reduction in the speed differential.

Study of the Interstate highway observations shows speeds which are similar to those obtained on other four-lane highways. Passenger car speeds at three of the four stations on Interstate highways (Station 4, had no classification of passenger cars) showed both Indiana and non-Indiana passenger cars traveling slightly slower on the Interstate system than those at the stations on the other





Interstate highways (Figures 1, 2, 3, and 4) and resulted in an average speed slightly higher for all of the Interstate Highway stations.

#### Comments on Statistical Design of the Speed Study

An analysis of variance (Table 18) for the data collected during this speed study, reveals that highway type, station location, vehicle type, and the interaction between highway and vehicle types are all highly significant. This is as expected. The significance of station location is particularly important because it indicates that the selection of the stations for the observation of speed will cause variations in the results obtained.

The estimate of the standard deviation of the location effect is 1.84. The use of four stations in each highway type (as was done) allows an estimate of the true average speed - for that type of highway - within plus or minus 1.8 mile per hour with a confidence level of 95%. To appreciably increase the precision of this estimate would require a large increase in the number of stations. This, of course, would result in an excessive cost increase for the study.

It is recommended, therefore, that four stations on each type of highway be continued in future studies. The techniques of securing speed data should be carefully and continuously reviewed by the observers in order to minimize observation effects which could cause a large station to station variance.

The data from this study indicates that the observation of 215 passenger cars produced the desired probable error - plus or minus one mile per hour at each station at a 95% confidence level - at eleven of the twelve stations. Thirty heavy truck observations would



have been adequate to attain the desired probable error of plus or minus two miles per hour at a 90% confidence level. At two locations, the number of heavy trucks controlled the survey time period. It is recommended, therefore, that the minimum station sample size for future studies continue to be 215 passenger cars and 35 heavy trucks.





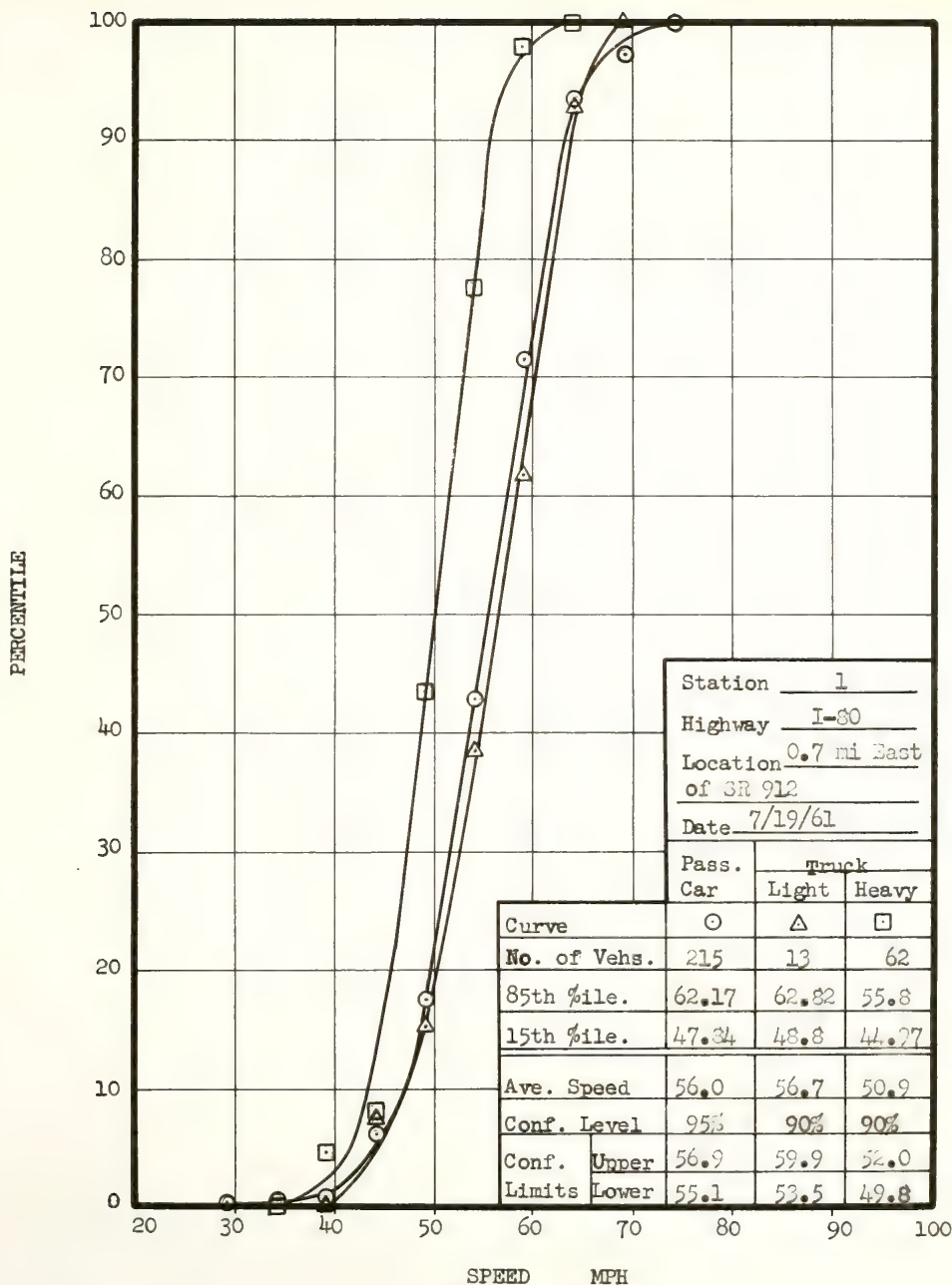


Figure 1



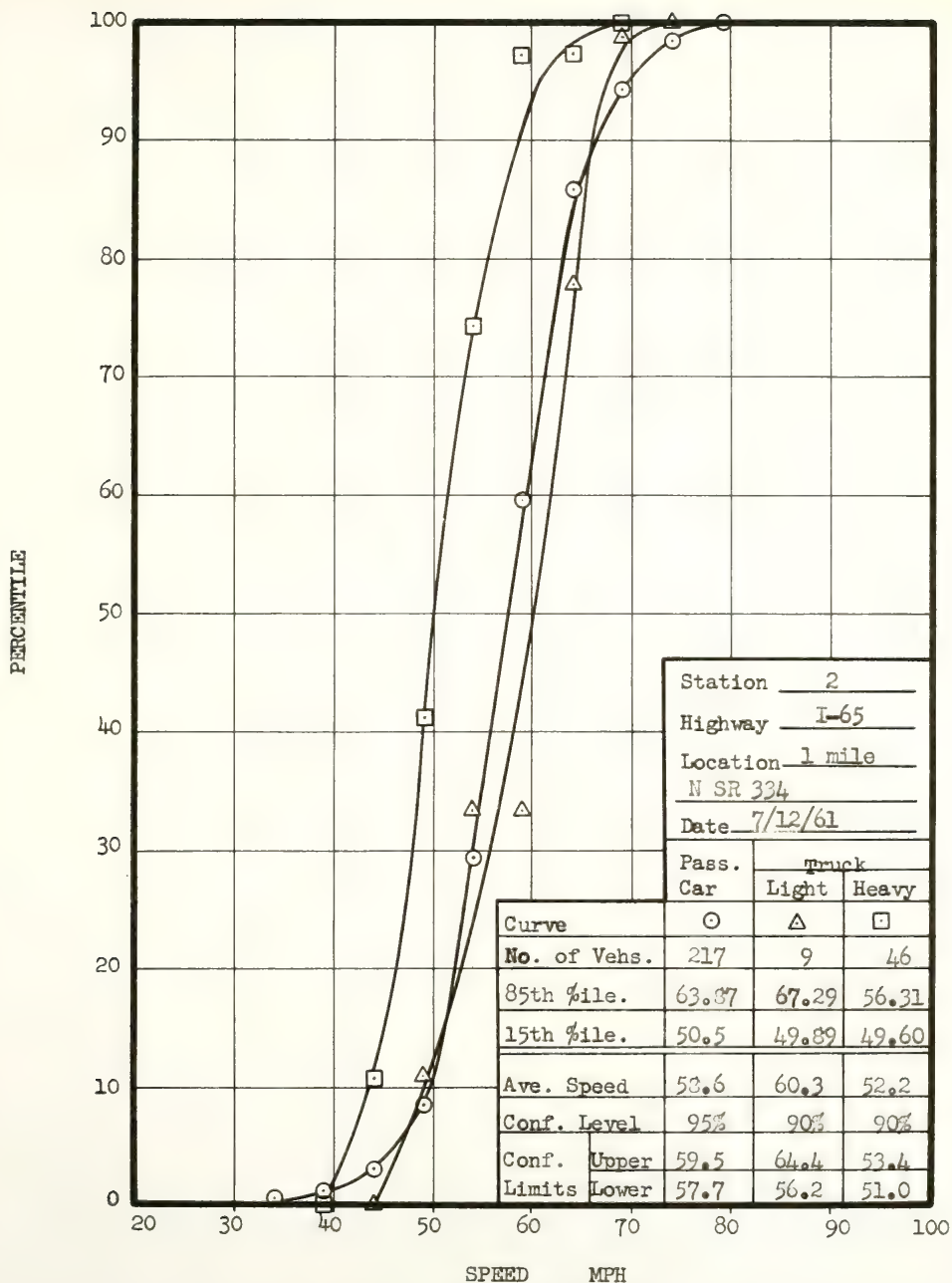


Figure 2



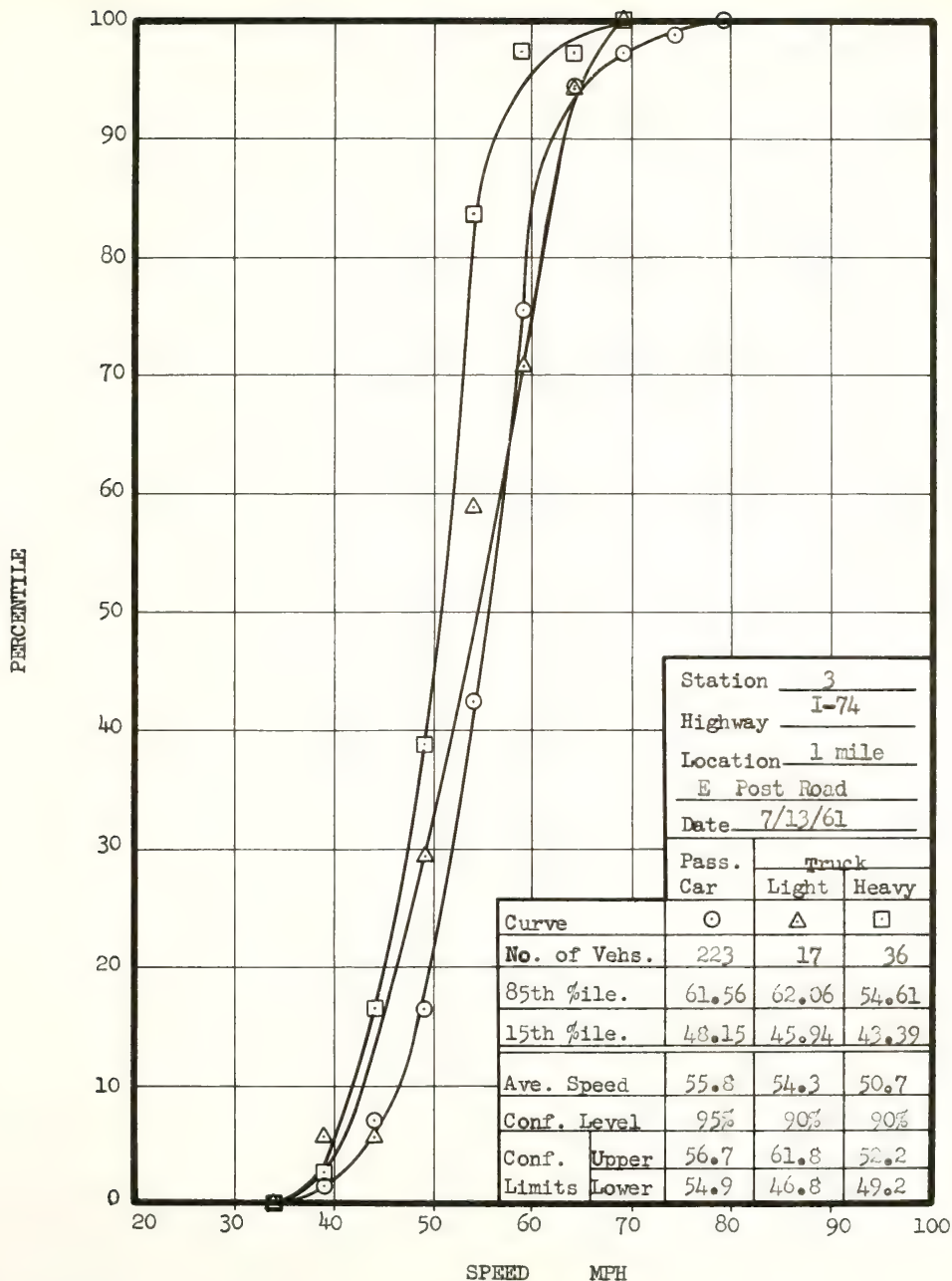


Figure 3





PERCENTILE

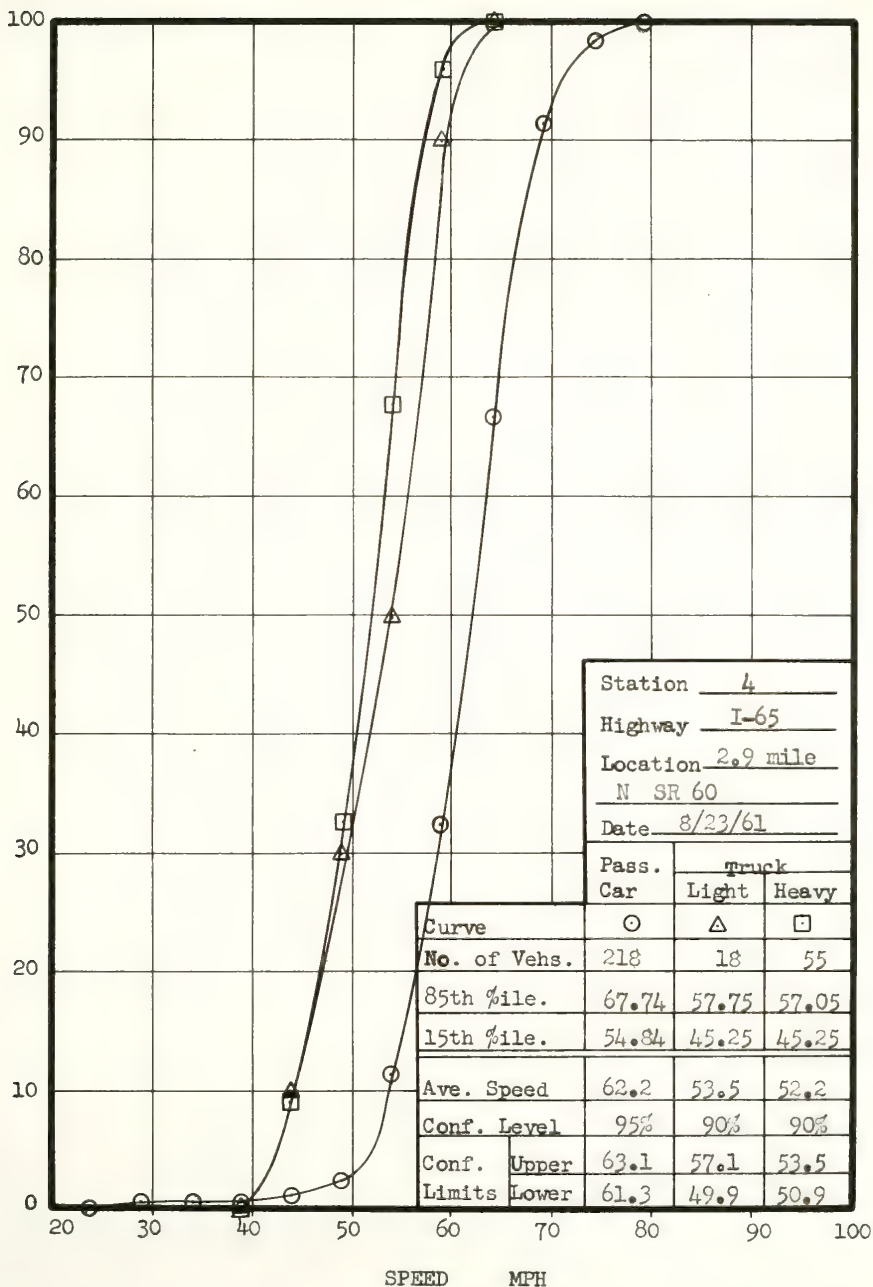


Figure 4



PERCENTILE

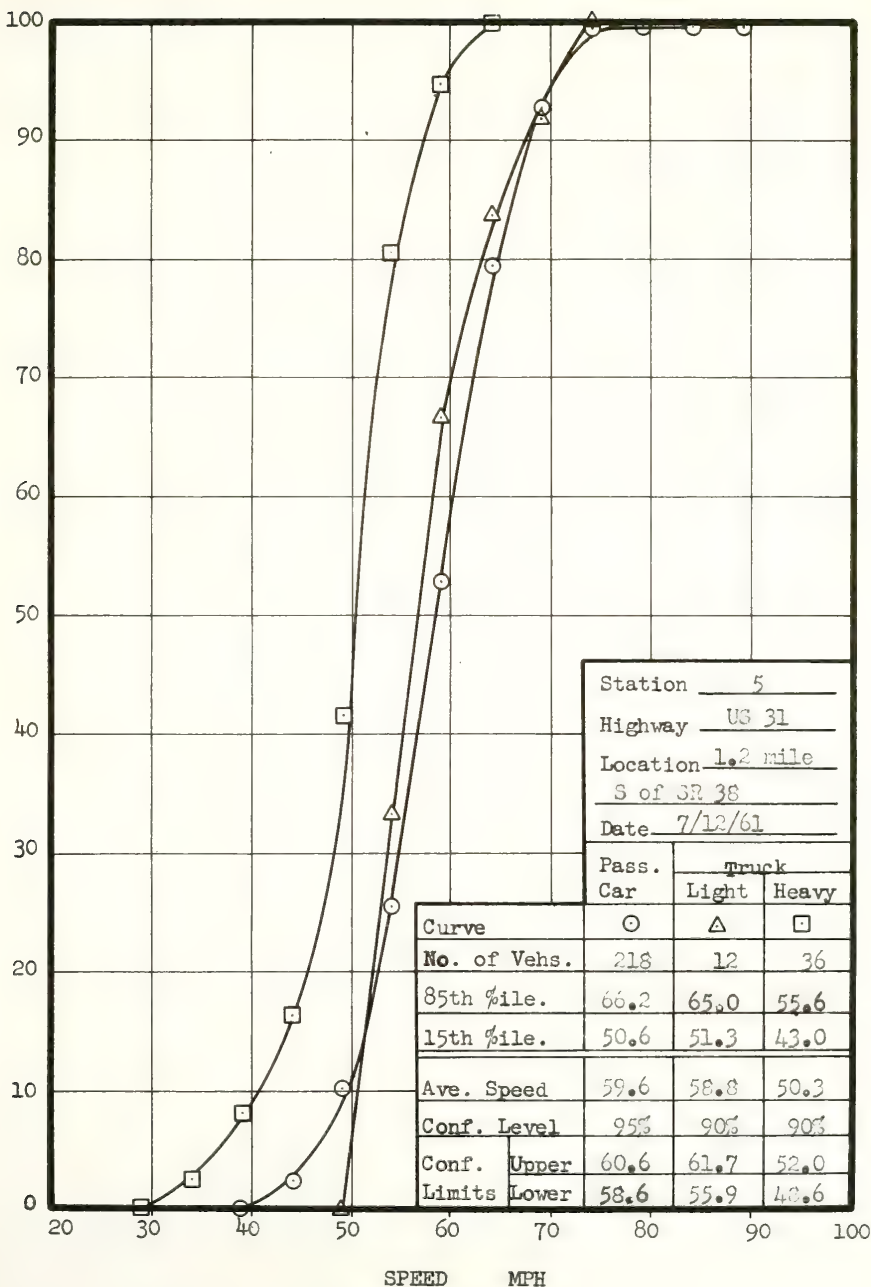


Figure 5





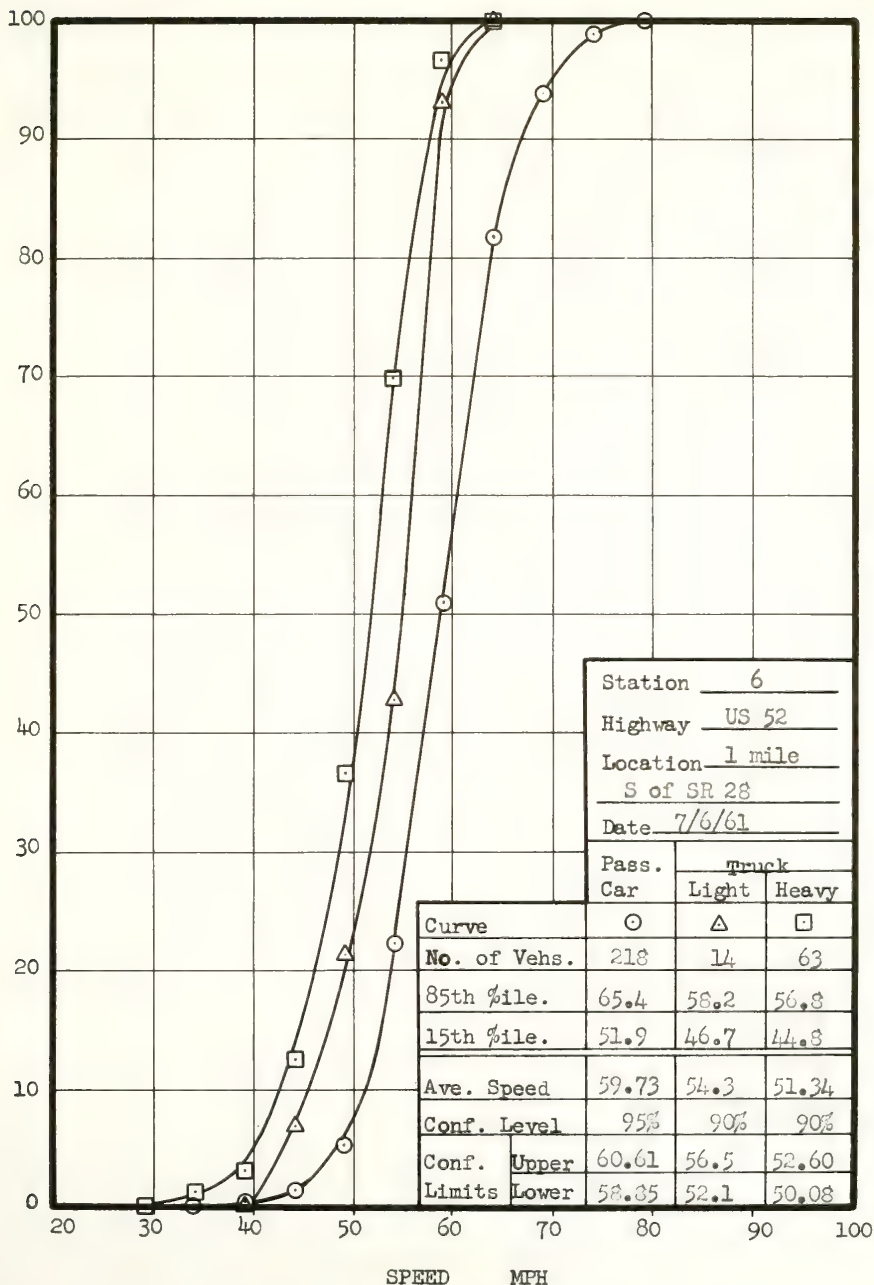


Figure 6



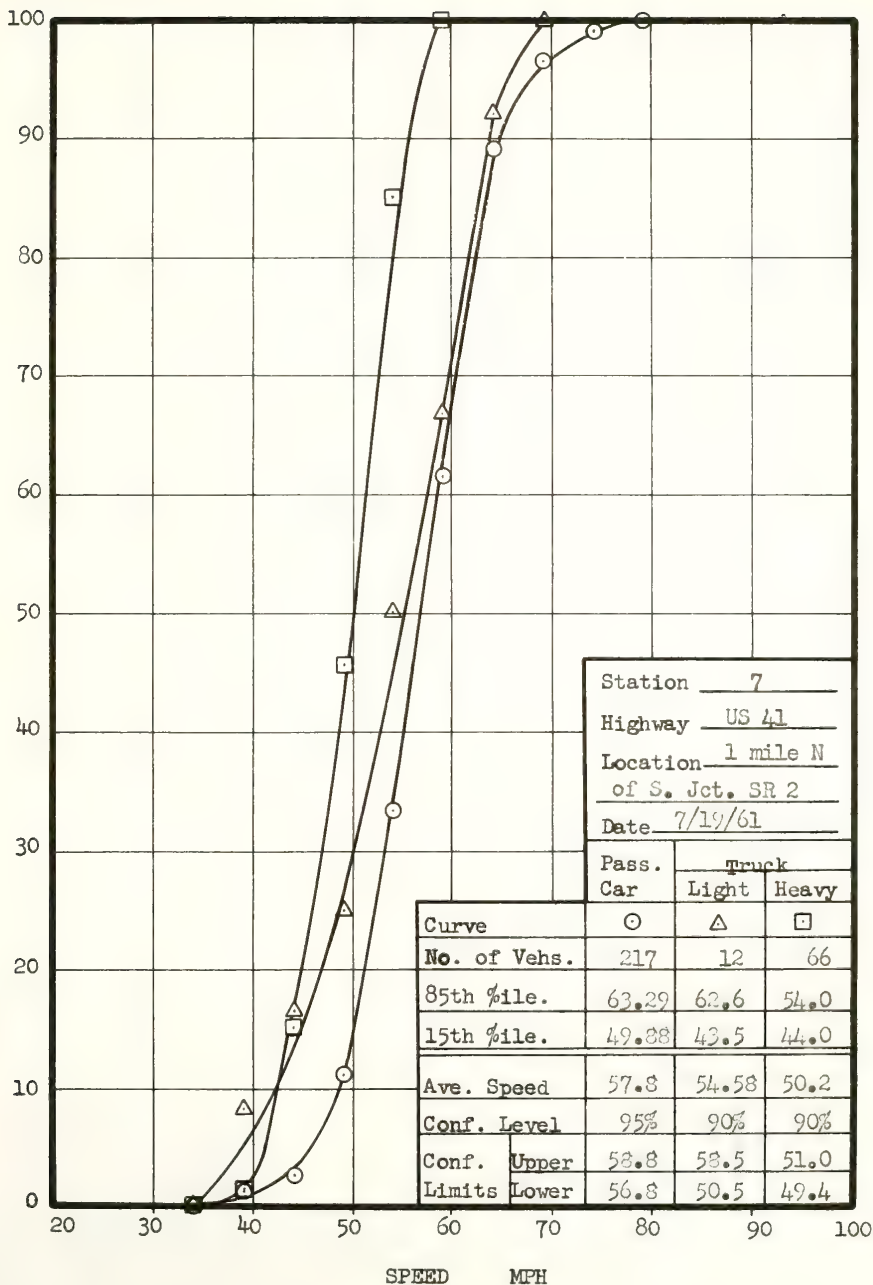


Figure 7



PERCENTILE

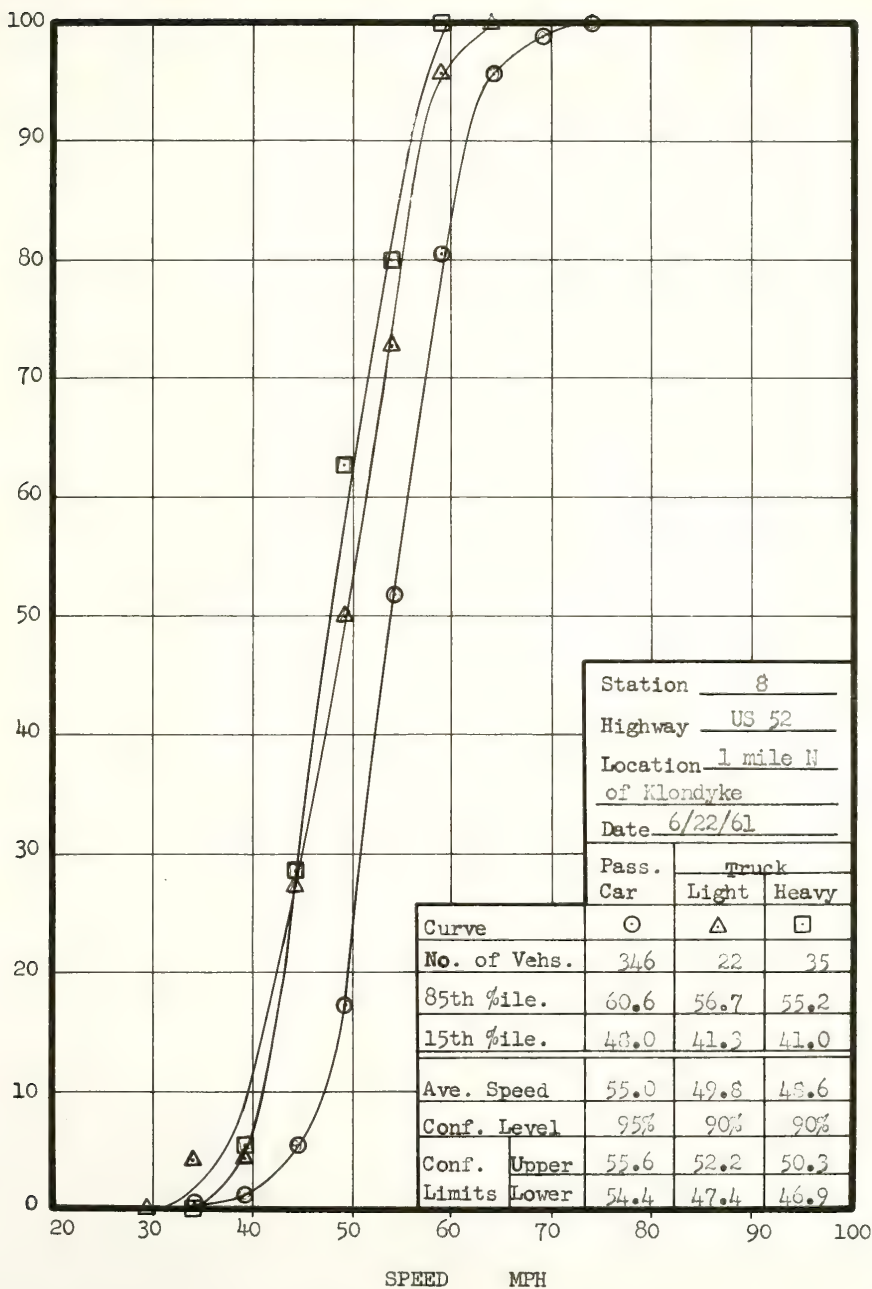


Figure 8



PERCENTILE

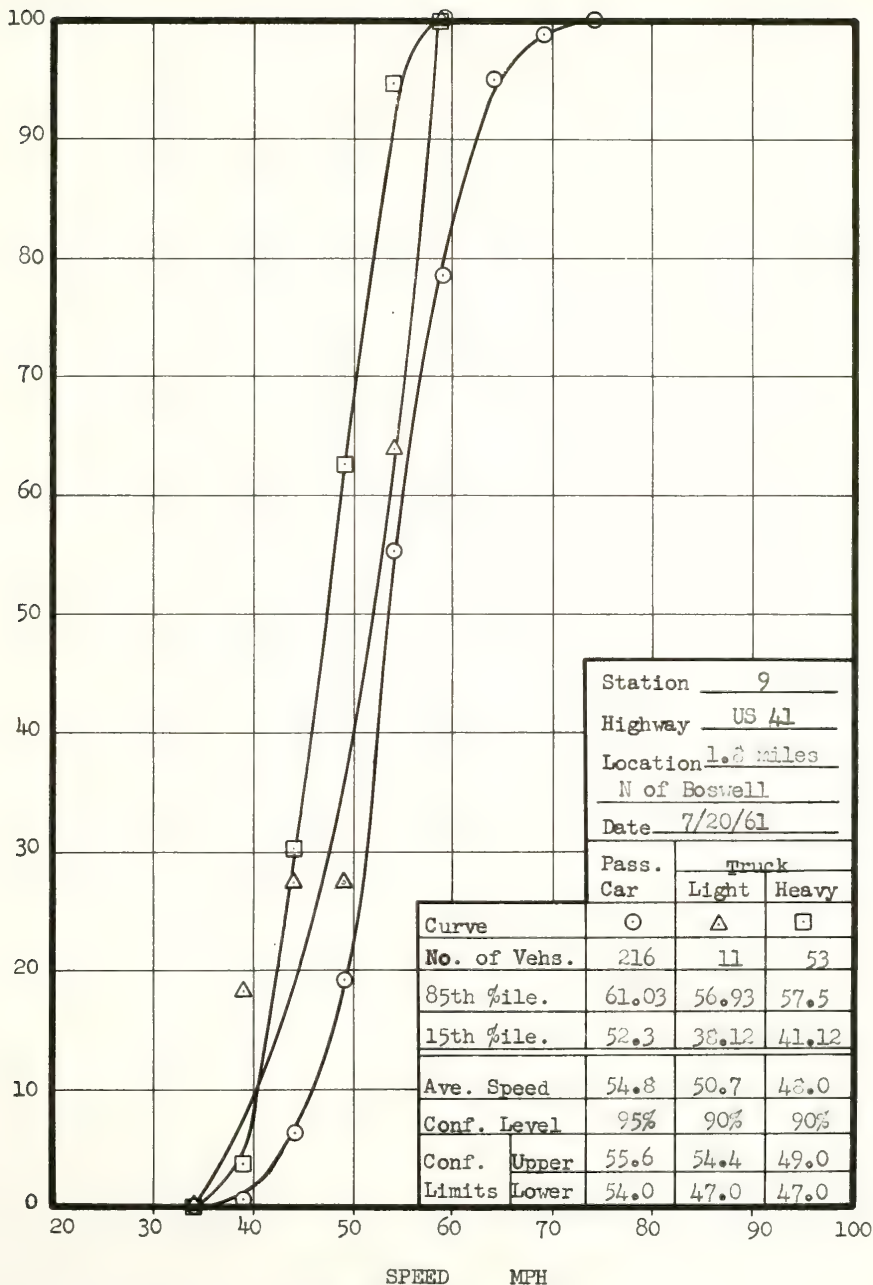


Figure 9





PERCENTILE

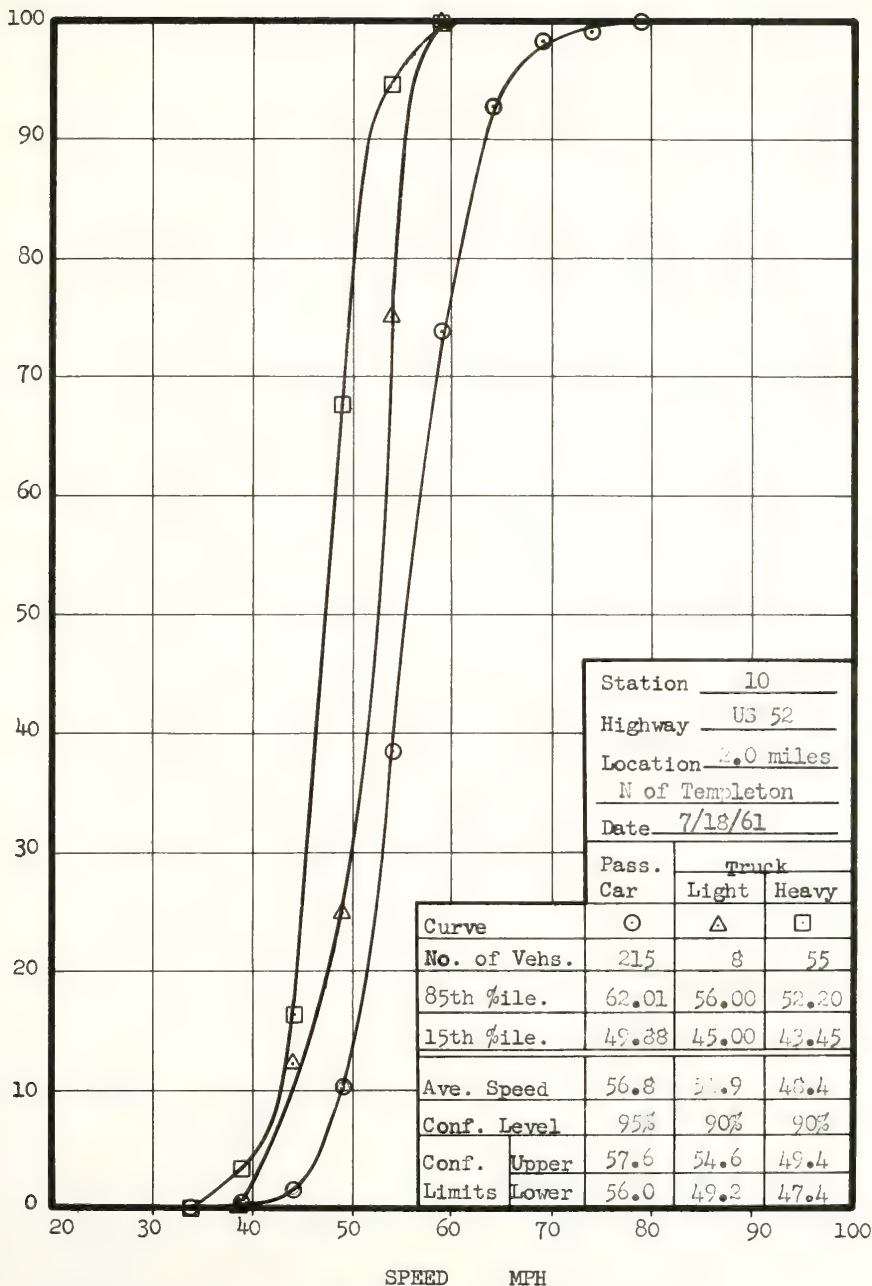


Figure 10



PERCENTILE

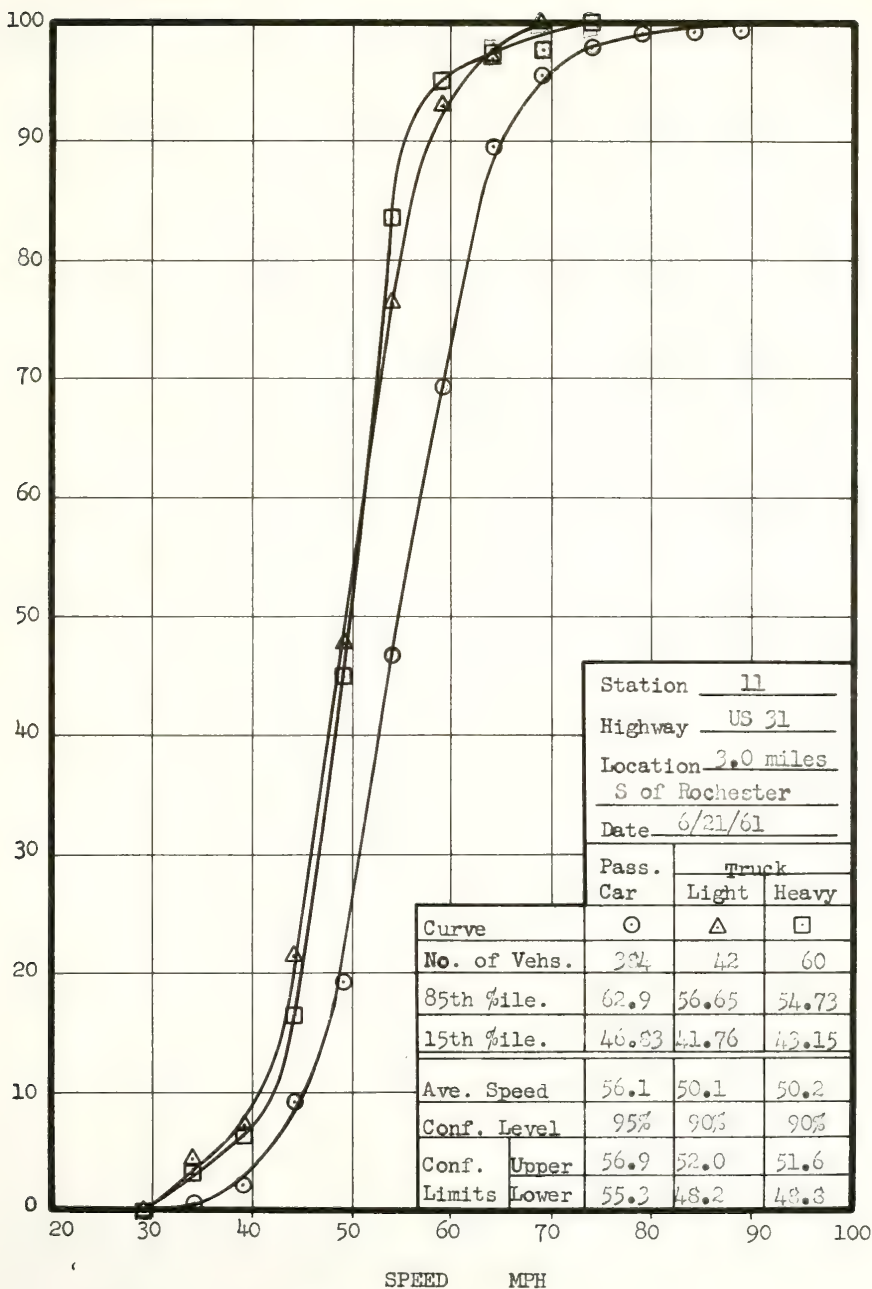


Figure 11



PERCENTILE

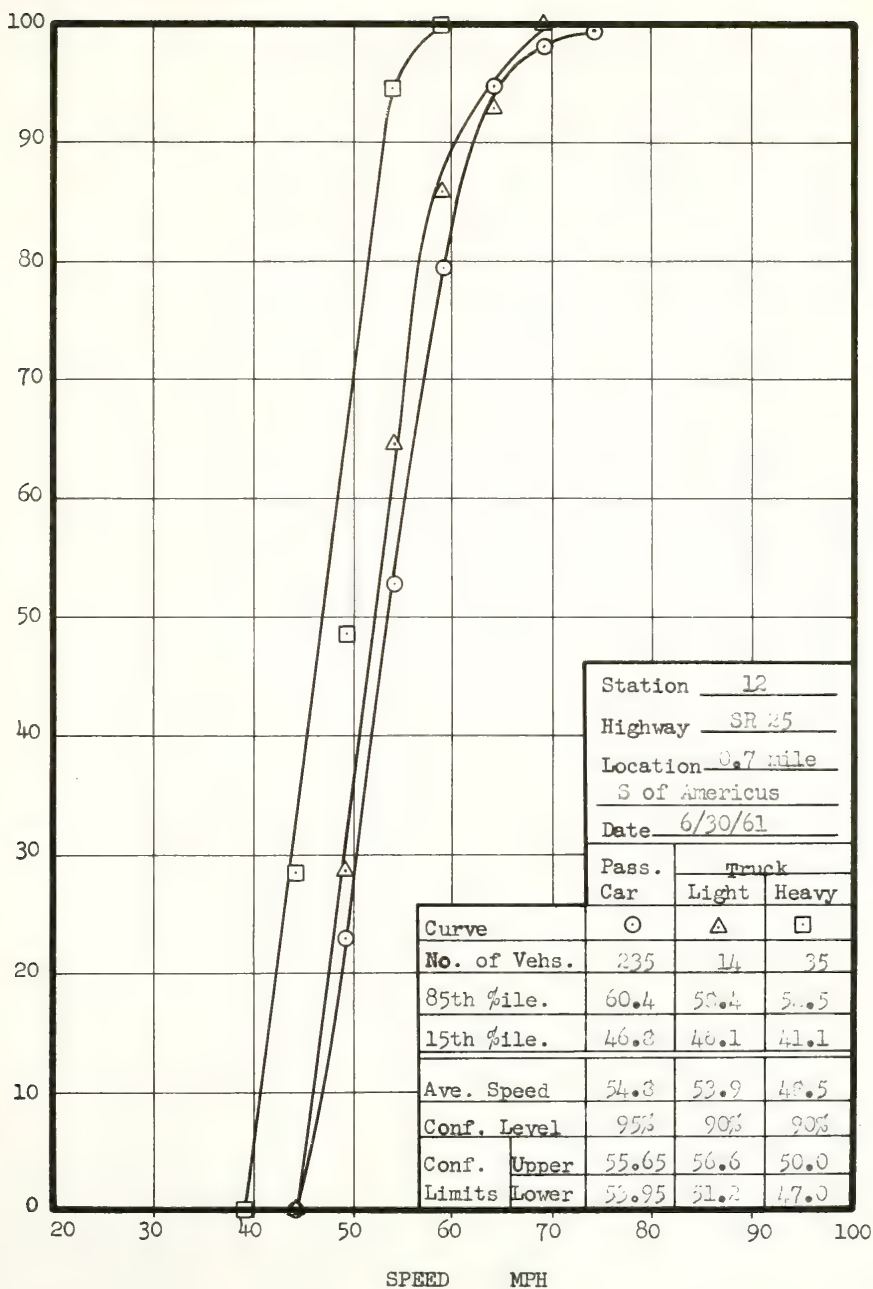


Figure 12



PERCENTILE

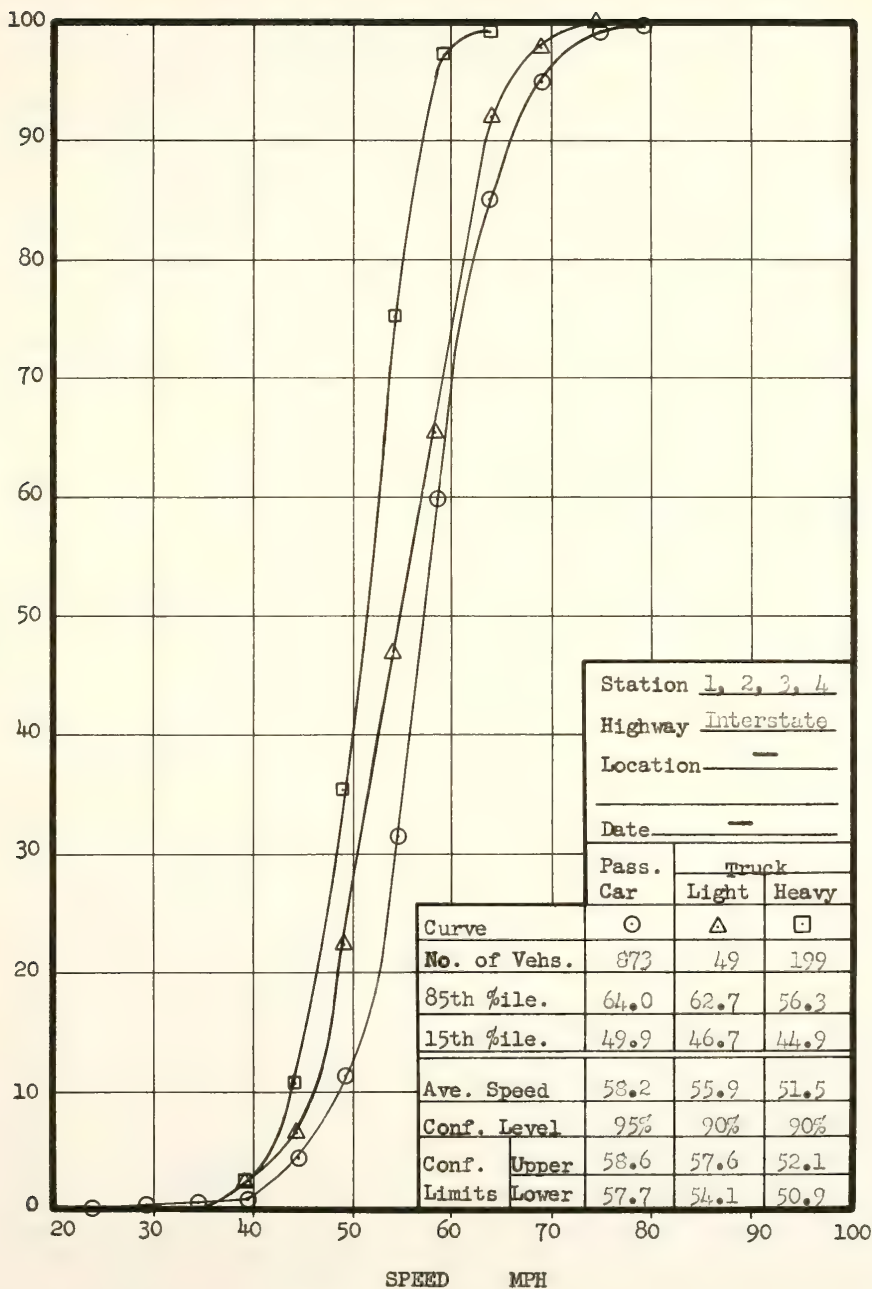


Figure 13





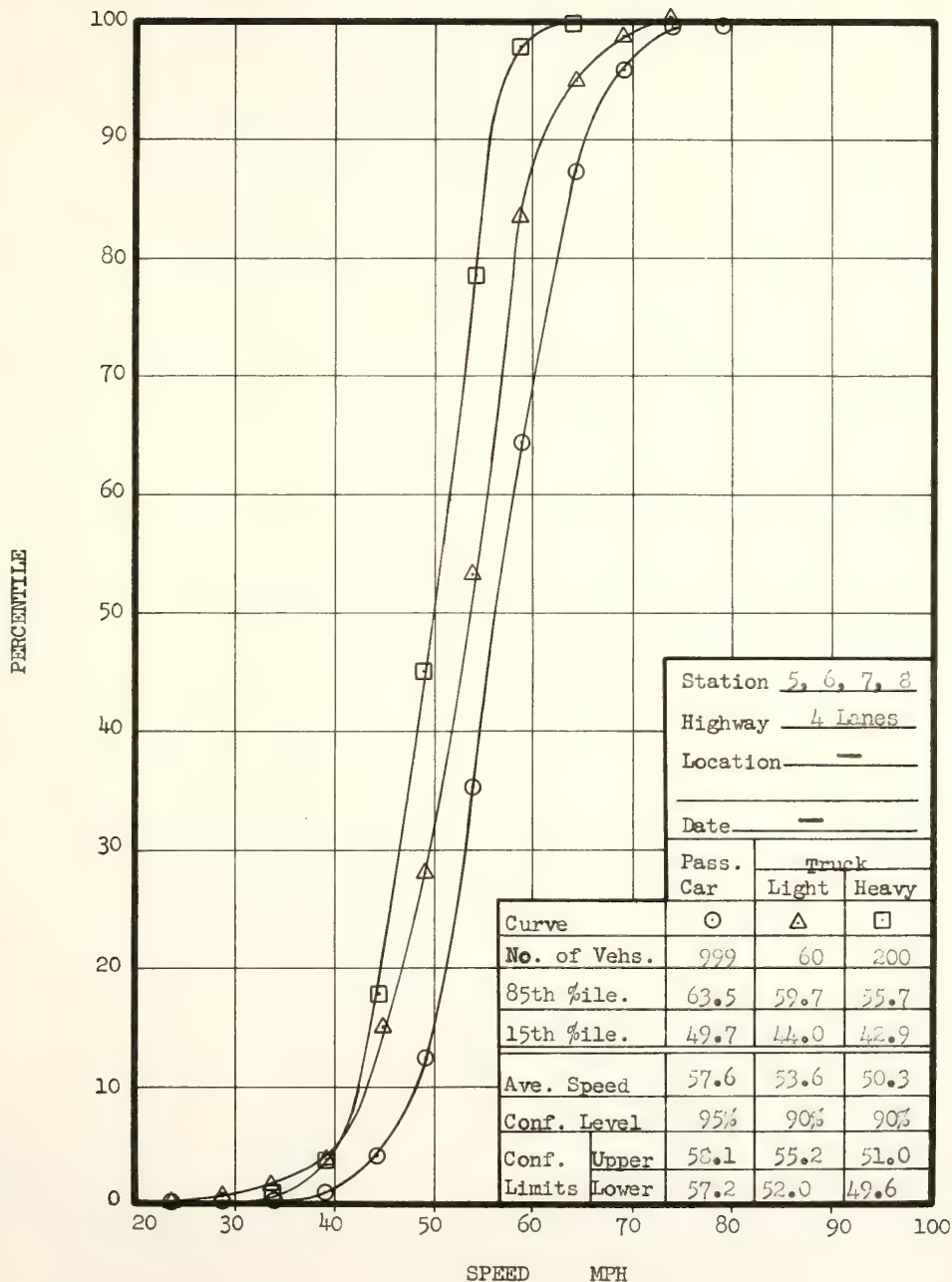


Figure 14



PERCENTILE

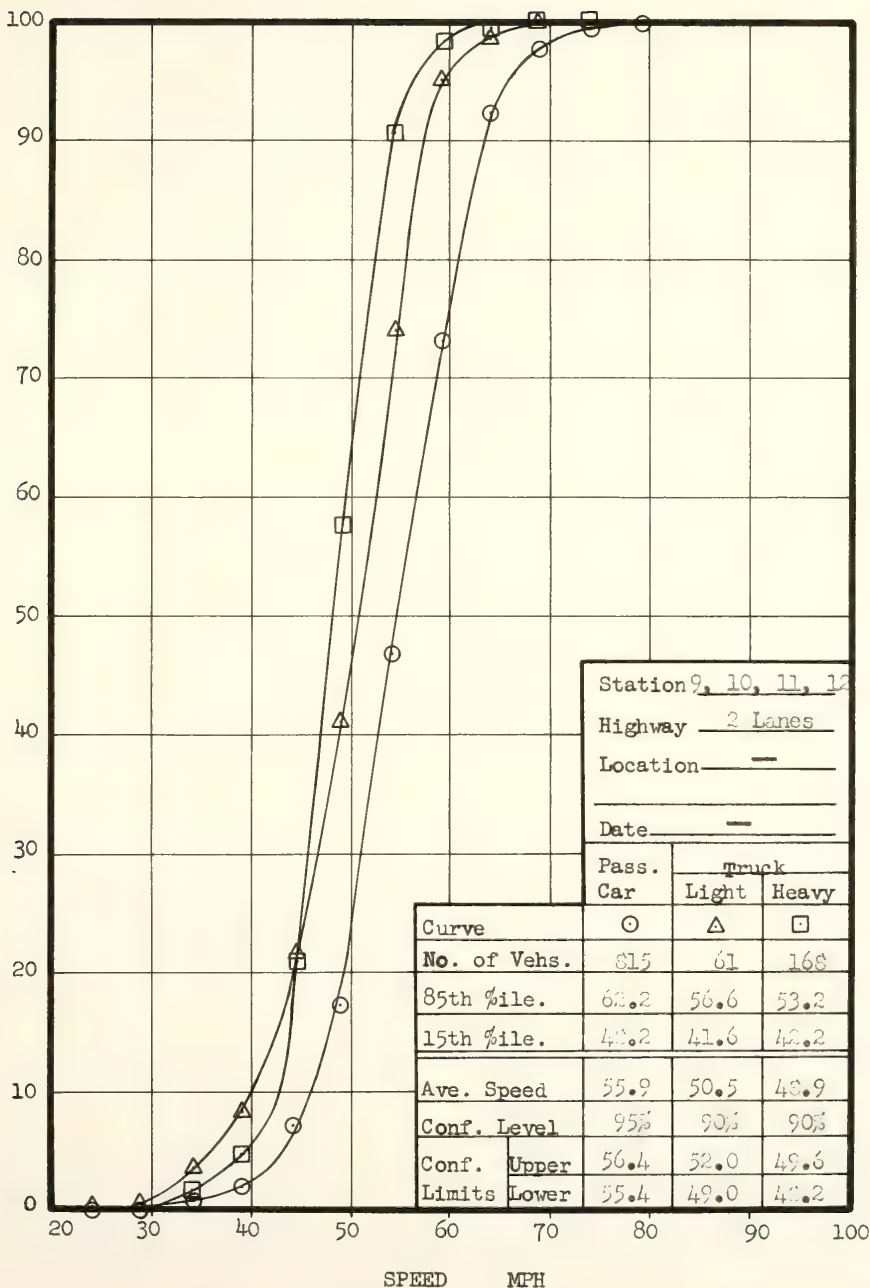


Figure 15



PERCENTILE

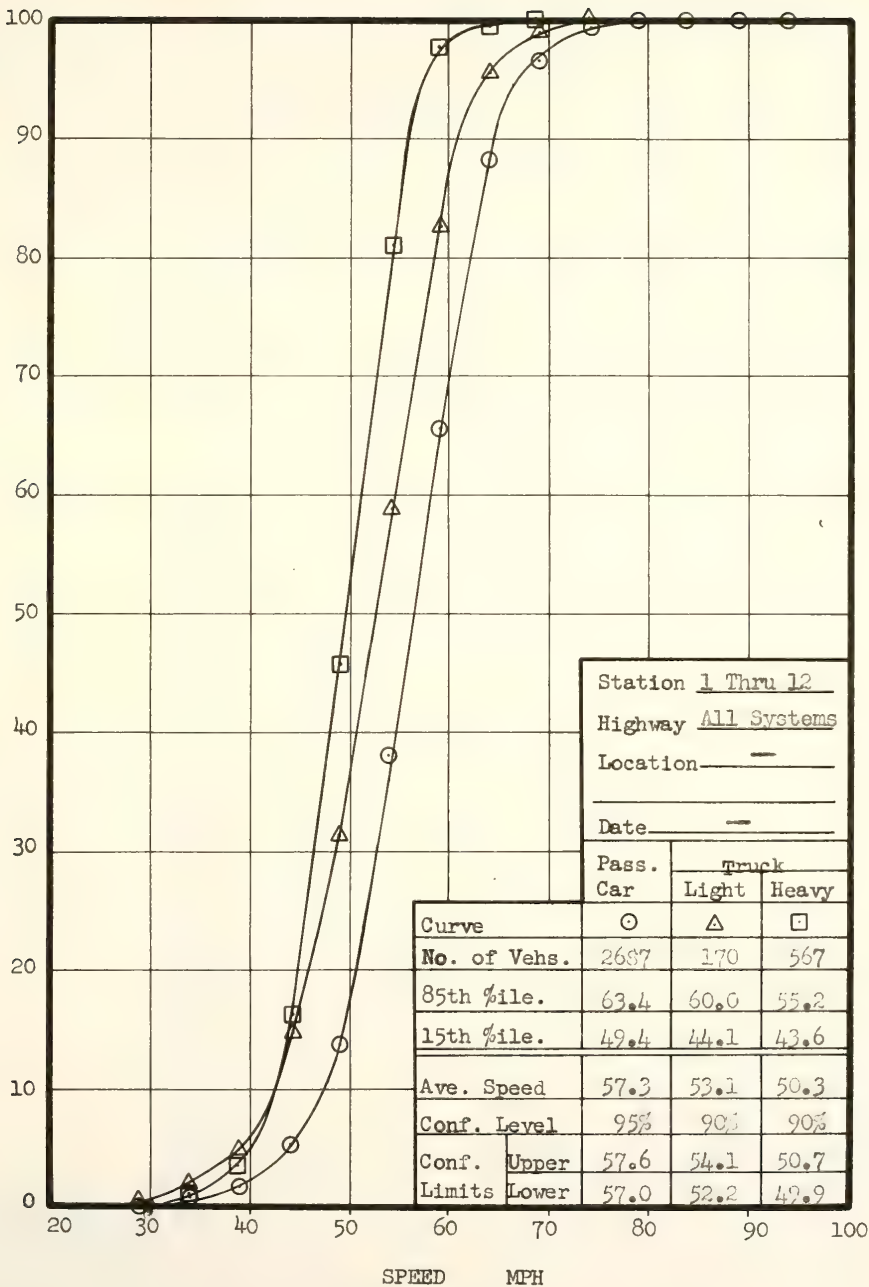


Figure 16



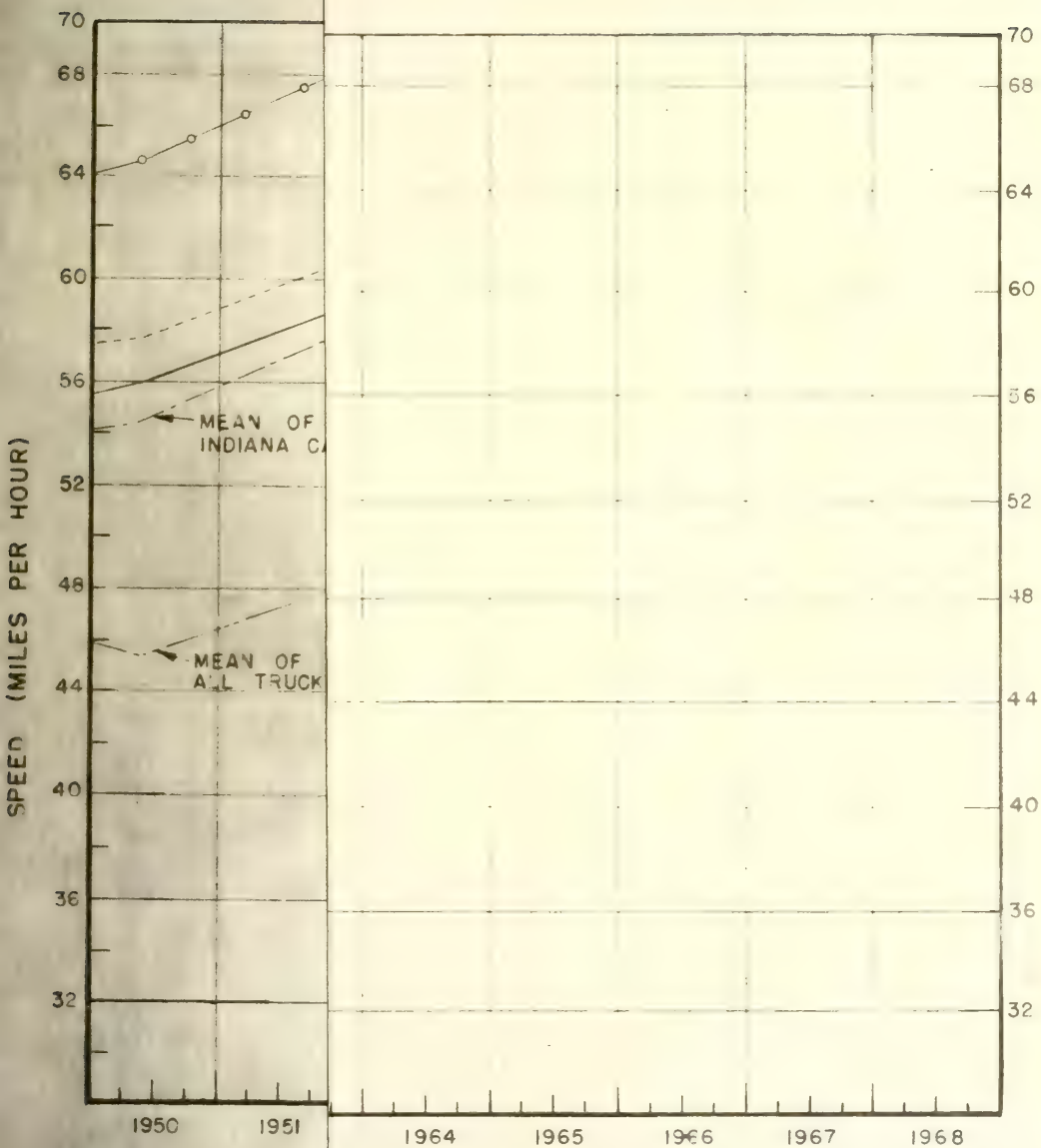
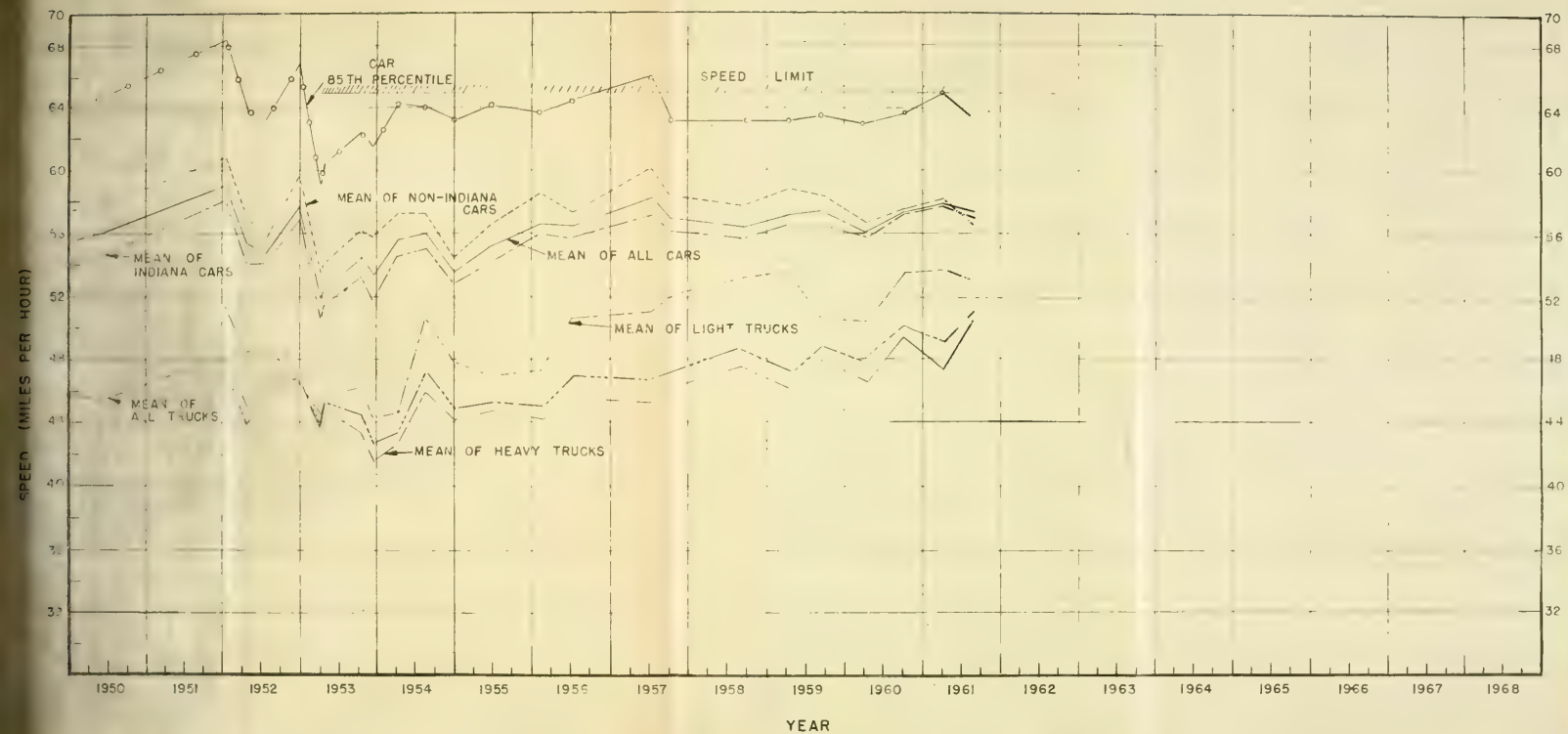


FIG. 17

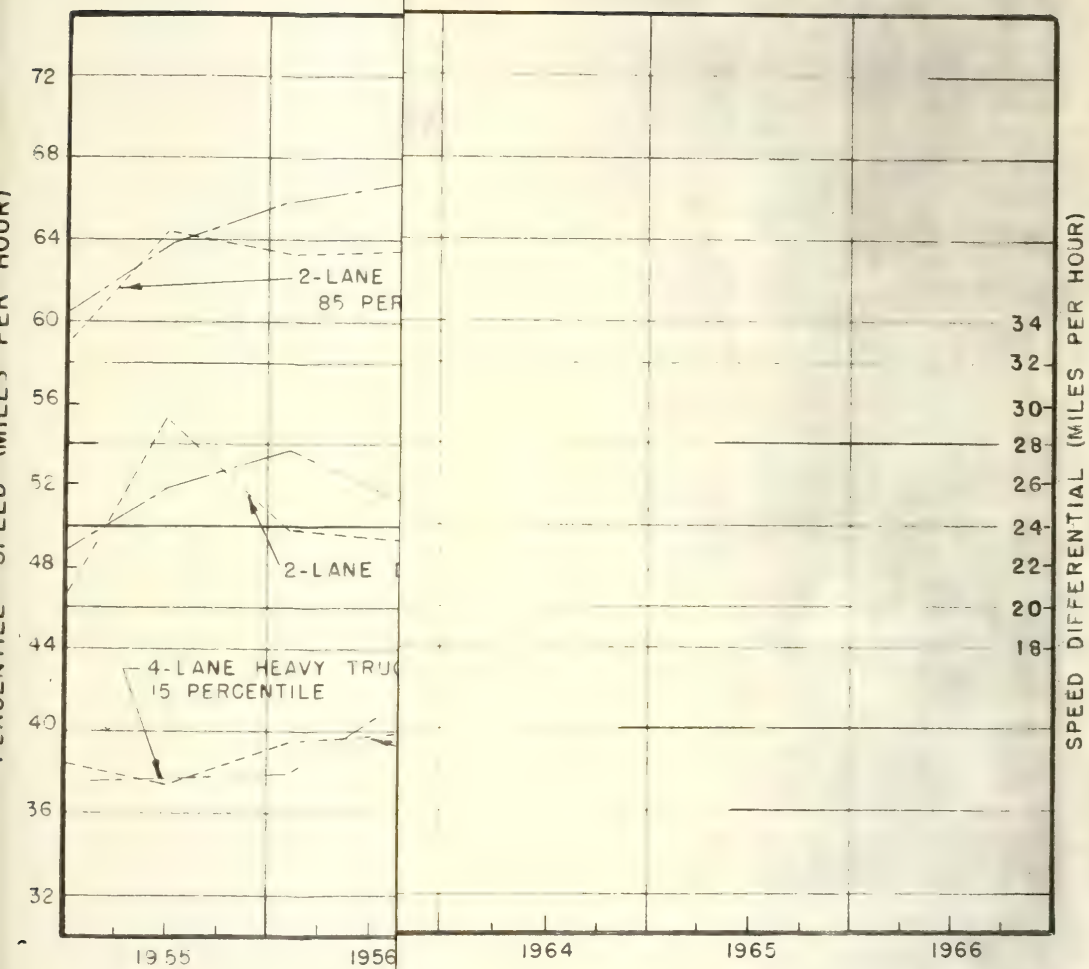






**INDIANA RURAL SPEED TRENDS 1950-1961**

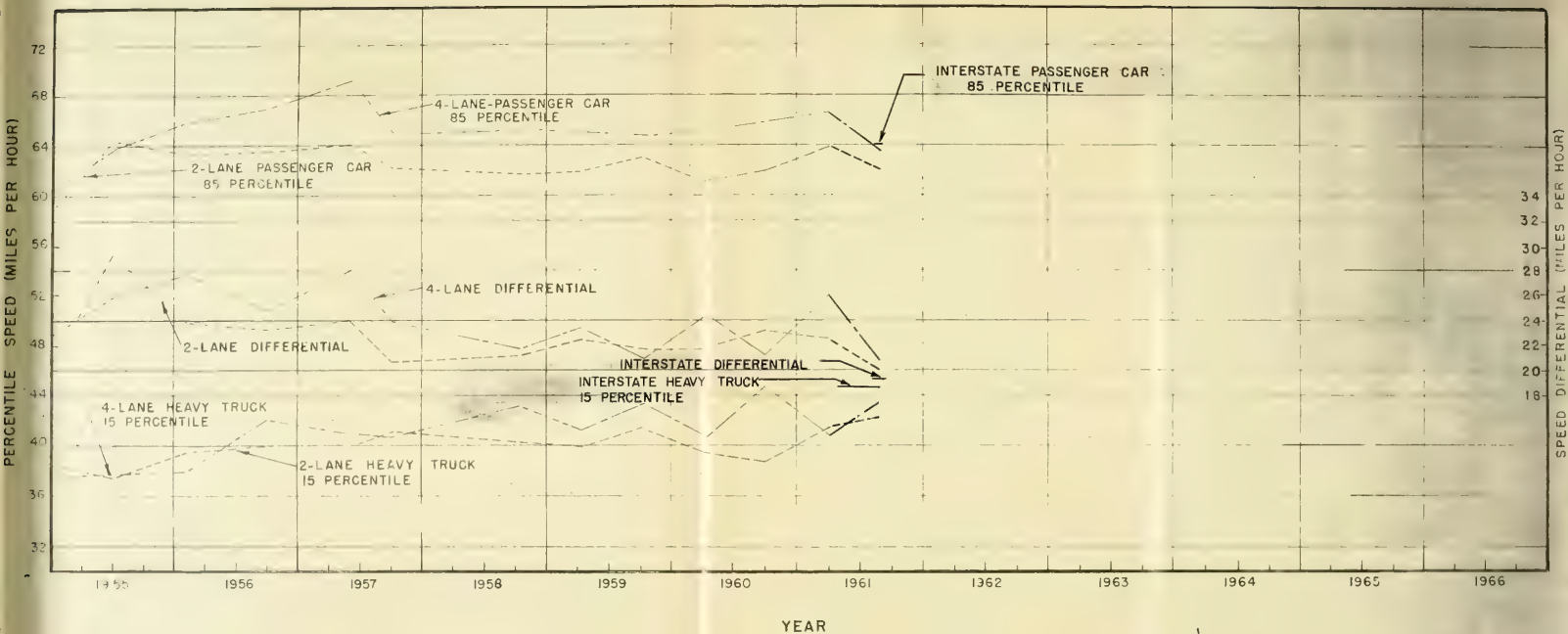




55-1961

FIG. 18





**TRENDS IN PERCENTILE SPEED & SPEED DIFFERENTIAL 1955-1961**



TABLE 1 SPEED DATA

Station	1	Highway	I-80	Location	0.7 mi east of SR 912
No. of Lanes	4	Type of Surface	Concrete	Weather	Partly cloudy
This Observation		Date	July 19, 1961	Last Previous Observation (Speed Report No. _____)	
Date		Time	11:15 AM	Date	No previous study at this
				Time	location

OBSERVATION	PASSENGER CARS						TRUCKS					
	All			Indiana			Non-Indiana			All		
	Last	Present		Last	Present		Last	Present		Last	Present	
No. of vehicles obs.		215			111			104			75	
Average speed (m.p.h.)		56.0			55.7			56.4			51.9	
Standard deviation		6.97			7.91			6.12			5.94	
24 m.p.h.		—			—			—			—	
29 m.p.h.		0			0			—			—	
34 m.p.h.		0.5			0.9			—			—	
39 m.p.h.		0.9			1.8			0			4.0	
44 m.p.h.		6.1			9.0			2.9			8.0	
49 m.p.h.		17.7			20.7			14.4			32.7	
54 m.p.h.		42.8			45.1			40.4			70.7	
59 m.p.h.		71.2			70.3			72.1			92.0	
64 m.p.h.		92.0			91.9			94.2			98.7	
69 m.p.h.		97.7			97.3			98.1			100.0	
74 m.p.h.		100.0			100.0			100.0			—	
79 m.p.h.		—			—			—			—	
84 m.p.h.		—			—			—			—	
89 m.p.h.		—			—			—			—	
No. of vehicles obs.		105			46			59			34	
Average speed		55.6			54.8			56.2			50.6	
No. of vehicles obs.		110			65			45			41	
Average speed		55.1			55.2			55.0			55.6	

2 of vehicles traveling  
at or less than

Bound





TABLE 2 SPEED DATA

Station 2 Highway I-65 Location 1 mile N SR 234

No. of Lanes 4 Type of Surface Asphalt Weather Clear

Date July 12, 1961 Last Previous Observation (Speed Report No.     )

Time 9:15 - 9:45 AM Date      to previous study at this location

PASSENGER CARS				TRUCKS			
OBSERVATION	All		Indiana		Non-Indiana		5000 pounds or more
	Last	Present	Last	Present	Last	Present	
No. of vehicles obs.		217		174		43	
Average speed (m.p.h.)		58.6		58.63		57.62	
Standard deviation		6.65		7.12		6.24	
24 m.p.h.		0		0		0	
29 m.p.h.		0		0		0	
34 m.p.h.		0.5		0.6		0	
39 m.p.h.		1.4		1.7		0	
44 m.p.h.		3.2		3.4		2.3	
49 m.p.h.		3.8		9.2		7.0	
54 m.p.h.		29.5		24.6		37.2	
59 m.p.h.		59.5		53.6		62.9	
64 m.p.h.		85.7		62.9		93.0	
69 m.p.h.		94.0		93.1		97.6	
74 m.p.h.		98.0		98.1		97.6	
79 m.p.h.		100.0		100.0		100.0	
84 m.p.h.							
89 m.p.h.							
All vehicles							
No. of vehicles obs.		108		88		20	
Average speed		57.9		58.1		57.0	
No. of vehicles obs.		109		86		23	
Average speed		59.0		59.3		58.2	
Bound Bound							
No. of vehicles obs.							
Average speed							
No. of vehicles obs.							
Average speed							



TABLE 3 SPEED DATA

Station 3 Highway I-74 Location 1 mile E of Post Road Weather Cloudy  
 No. of Lanes 4 Type of Surface PCC Last Previous Observation (Speed Report No.     )  
 Date July 13, 1961 Date No previous study at this  
 Time 3:30 - 4:15 PM Time location

PASSENGER CARS				TRUCKS								
OBSERVATION	All		Indiana		Non-Indiana		All		Less than 5000 pounds		5000 pounds or more	
	Last	Present	Last	Present	Last	Present	Last	Present	Last	Present	Last	Present
No. of vehicles obs.		223		183		35		53		17		36
Average speed (m.p.h.)		55.8		55.4		57.6		51.8		54.2		50.7
Standard deviation		6.83		6.75		5.69		6.86		7.48		5.60
24 m.p.h.		0		0		0		0		0		0
29 m.p.h.		0		0		0		0		0		0
34 m.p.h.		0		0		0		0		0		0
39 m.p.h.		1.8		1.6		2.9		3.3		5.9		2.8
44 m.p.h.		7.2		7.4		5.7		13.2		5.9		16.7
49 m.p.h.		16.6		18.1		8.6		35.3		29.4		38.9
54 m.p.h.		42.2		43.6		24.3		75.5		58.8		83.3
59 m.p.h.		75.3		78.2		60.0		88.7		70.6		97.2
64 m.p.h.		94.2		94.7		91.4		96.2		94.1		97.2
69 m.p.h.		97.8		97.9		97.1		100.0		100.0		100.0
74 m.p.h.		99.1		99.5		97.1						
79 m.p.h.		100.0		100.0		100.0						
84 m.p.h.												
89 m.p.h.												
% of vehicles traveling at or less than												
No. of vehicles obs.		120		100		20						16
Average speed		55.37		54.75		50.50						50.0
No. of vehicles obs.		103		88		15						20
Average speed		56.28		56.25		56.30						51.25



TABLE 4 SPEED DATA

Station 4 Highway I-65 Location 2.9 miles north of SR 60 (Milepost 22) Weather Partially cloudy, warm

No. of Lanes 4 Type of Surface PCC Last Previous Observation (Speed Report No.     )

Date August 23, 1961 Date      No previous study at this     

Time 2:30 - 4:20 PM Time      location     

PASSENGER CARS				TRUCKS								
OBSERVATION	All		Indiana		Non-Indiana		All		Less than 5000 pounds		5000 pounds or more	
	Last	Present	Last	Present	Last	Present	Last	Present	Last	Present	Last	Present
No. of vehicles obs.		213						65		10		55
Average speed (m.p.h.)		62.2						52.4		53.5		52.2
Standard deviation		6.64						5.26		5.83		5.06
24 m.p.h.		0										
29 m.p.h.		0.46										
34 m.p.h.		0.46										
39 m.p.h.		0.46										
44 m.p.h.		1.38						0		0		0
49 m.p.h.		2.75						9.2		10.0		9.09
54 m.p.h.		11.47						22.3		30.0		32.73
59 m.p.h.		32.37						64.6		50.0		67.27
64 m.p.h.		66.51										
69 m.p.h.		91.28						95.4		90.0		96.26
74 m.p.h.		98.20						100.0		100.0		100.0
79 m.p.h.		100.0										
84 m.p.h.												
89 m.p.h.												
No. of vehicles obs.		110						29		6		23
Average speed		62.0						50.9		54.2		50.1
No. of vehicles obs.		108						36		4		32
Average speed		62.4						52.6		52		53.8
All vehicles												
at or less than												
% of vehicles traveling												
No. of vehicles obs.												
Average speed												
No. of vehicles obs.												
Average speed												
Bound Bound												





TABLE 5 SPEED DATA

Station 5 Highway US 31 Location 1.2 miles S of SR 38 Weather Cloudy - Clear  
 No. of Lanes 4 Type of Surface PCC and Bituminous Last Previous Observation (Speed Report No.     )  
 Date July 12, 1961 Date      No previous study at this       
 Time 1 - 2 PM Time      location     

PASSENGER CARS				TRUCKS			
OBSERVATION	All		Non-Indiana		All		5000 pounds or more
	Last	Present	Last	Present	Last	Present	
No. of vehicles obs.		215		52		48	36
Average speed (m.p.h.)		59.6		59.5		52.4	50.3
Standard deviation		7.56		7.25		6.56	6.33
24 m.p.h.							
29 m.p.h.							
34 m.p.h.							
39 m.p.h.					2.1		2.8
44 m.p.h.					6.3		8.3
49 m.p.h.		2.7		3.9		12.5	16.7
54 m.p.h.		10.1		7.7		21.2	41.6
59 m.p.h.		25.6		25.0		68.8	80.5
64 m.p.h.		52.7		50.0		87.5	94.5
69 m.p.h.		79.3		82.6		95.7	100.0
74 m.p.h.		92.5		90.4		97.3	
79 m.p.h.		98.0		100.0		100.0	
84 m.p.h.		99.0					
89 m.p.h.		99.0					
at or less than							
% of vehicles traveling		99.0					
		98.7					
		98.7					
		98.7					
		98.7					
		98.7					
		98.7					
No. of vehicles obs.		106		26		23	17
Average speed		59.7		57.1		55.1	53.7
No. of vehicles obs.		112		26		25	19
Average speed		59.4		61.9		49.9	47.2



















TABLE 9 SPEED DATA

Station 9 Highway US 41 Location 1.0 miles N of Roswell Weather Clear  
 No. of Lanes 2 Type of Surface PCB Last Previous Observation (Speed Report No. 72)  
This Observation Date July 20, 1961 Date March 31, 1961  
 Time 2:30 - 4:25 PM Time 9:30 - 11:10 AM

PASSENGER CARS				TRUCKS			
OBSERVATION	ALL		Indiana		Non-Indiana		5000 pounds or more
	Last	Present	Last	Present	Last	Present	
No. of vehicles obs.	343	216	143	98	200	116	36
Average speed (m.p.h.)	55.7	54.0	55.6	55.2	55.7	54.4	44.9
Standard deviation	—	6.25	—	7.15	—	2.03	—
24 m.p.h.	—	0	—	0	—	0	—
29 m.p.h.	—	0	—	0	—	0	—
34 m.p.h.	—	0	—	0	—	0	—
39 m.p.h.	—	0.9	—	2.0	—	0	—
44 m.p.h.	—	6.5	—	7.1	—	5.9	—
49 m.p.h.	12.0	19.4	16.8	20.4	8.5	12.7	—
54 m.p.h.	38.8	55.1	39.9	53.1	38.0	56.8	—
59 m.p.h.	72.6	78.2	72.7	72.4	62.5	83.1	—
64 m.p.h.	84.5	94.9	92.7	92.9	80.0	96.6	—
69 m.p.h.	98.5	99.1	97.2	98.0	99.5	100.0	—
74 m.p.h.	99.4	100.0	98.6	100.0	100.0	—	—
79 m.p.h.	—	—	—	—	—	—	—
84 m.p.h.	—	—	—	—	—	—	—
89 m.p.h.	—	—	—	—	—	—	—
% of vehicles traveling at or less than							
No. of vehicles obs.	93	113	43	50	26	63	20
Average speed	56.7	53.7	57.4	54.3	46.5	53.2	42.1
No. of vehicles obs.	250	103	100	48	26	55	16
Average speed	55.4	55.9	54.8	56.1	47.0	55.2	44.7





TABLE 10 SPEED DATA

Station 10 Highway US 52 Location 2.0 miles N. of Templeton Weather Cloudy - Clear  
 No. of Lanes 2 Type of Surface Bituminous Last Previous Observation (Speed Report No. 72)  
 Date July 18, 1961 Date March 31, 1961  
 Time 2:15 PM Time 12:15 - 1:30 PM

PASSENGER CARS										TRUCKS			
OBSERVATION	All			Indiana		Non-Indiana		All		Less than 5000 pounds		5000 pounds or more	
	Last	Present	Last	Present	Last	Present	Last	Present	Last	Present	Last	Present	Last
No. of vehicles obs.	355	215	140	97	215	118	46	63	10	8	36	55	
Average speed (m.p.h.)	56.5	56.8	56.3	57.4	56.6	56.4	48.7	48.9	51.3	51.9	48.0	48.4	
Standard deviation		6.1		6.48		5.19		4.46		4.58		4.38	
24 m.p.h.		0		0		0		0		0		0	
29 m.p.h.		0		0		0		0		0		0	
34 m.p.h.		0		0		0		0		0		0	
39 m.p.h.		0.5		0		0.9		3.2		0		2.6	
44 m.p.h.		1.9		2.1		1.7	30.4	15.9	20.0	12.5	33.3	16.4	
49 m.p.h.	10.1	10.2	12.1	12.4	8.8	8.5	42.5	61.9	40.0	25.0	44.4	67.3	
54 m.p.h.	36.9	38.5	35.0	35.1	38.1	38.1	80.4	92.1	100.0	75.0	86.1	94.5	
59 m.p.h.	62.3	73.5	62.9	69.1	61.9	77.1	97.5	100.0	90.0	100.0	100.0	100.0	
64 m.p.h.	92.9	92.6	92.9	88.7	93.0	95.8	100.0		100.0				
69 m.p.h.	99.2	98.6	99.3	96.9	99.1	100.0							
74 m.p.h.	99.7	99.5	99.3	99.0	100.0								
79 m.p.h.		100.0		100.0									
84 m.p.h.													
89 m.p.h.													
at or less than													
No. of vehicles traveling	174	131	83	56	91	75	16	30	3	4	13	26	
Average speed	57.4	57.6	57.2	59.0	57.6	56.5	46.3	49.7	49.3	53.8	45.5	49.0	
No. of vehicles obs.	181	84	57	41	124	43	30	33	7	4	23	29	
Average speed	55.5	55.6	54.9	55.2	55.8	56.1	50.1	47.1	52.1	50.0	49.4	47.8	



TABLE 11 SPEED DATA

Station 11 Highway US 31 Location 3.0 miles S of Rochester Weather Clear - Sunny  
 No. of Lanes 2 Type of Surface Asphalt Last Previous Observation (Speed Report No. 72)  
 Date June 21, 1961 Date April 3, 1961  
 Time 10:40-12:00 AM, 1:00 PM - Time 3:15 - 5:35 PM

PASSENGER CARS										TRUCKS			
OBSERVATION	ALL		Indiana		Non-Indiana		ALL		Less than 5000 pounds		5000 pounds or more		
	Last	Present	Last	Present	Last	Present	Last	Present	Last	Present	Last	Present	
No. of vehicles obs.	339	384	271	285	68	99	82	102	25	42	57	60	
Average speed (m.p.h.)	57.1	56.0	57.1	56.1	57.4	55.9	49.9	50.2	54.6	50.1	47.3	50.2	
Standard deviation		3.13		9.02		6.53		6.97		7.33		6.43	
24 m.p.h.		0		0		0		0		0		0	
29 m.p.h.		0		0		0		0		0		0	
34 m.p.h.		0.3		1.1		0		3.9		4.3		3.3	
39 m.p.h.		2.1		2.5		1.0		6.9		7.1		6.7	
44 m.p.h.		9.4		11.2		4.0	23.1	17.6	4.0	21.4	31.5	16.7	
49 m.p.h.	11.2	19.3	12.2	20.7	7.4	15.0	45.1	46.1	23.0	47.6	52.6	45.0	
54 m.p.h.	35.1	46.8	37.6	45.2	25.0	52.0	76.3	30.4	52.0	76.2	37.7	33.3	
59 m.p.h.	61.1	69.0	62.0	69.1	57.4	62.0	24.1	94.0	60.0	92.3	94.7	95.0	
64 m.p.h.	83.3	89.5	87.3	93.5	92.6	92.0	27.5	93.0	92.0	97.5	100.0	93.3	
69 m.p.h.	94.6	95.4	94.1	94.0	95.6	93.0	100.0	99.0	100.0	100.0		93.3	
74 m.p.h.		97.3	97.3	97.3	98.5	100.0		100.0				100.0	
79 m.p.h.		99.5		99.3									
84 m.p.h.		99.5		99.3									
89 m.p.h.		99.5		99.3									
No. of vehicles obs.	130	130	140	133	40	47	30	43	13	23	17	25	
Average speed	57.5	56.4	57.3	57.0	53.2	55.2	49.3	50.4	53.3	50.5	46.3	50.9	
No. of vehicles obs.	159	204	121	152	23	52	52	54	12	19	40	35	
Average speed	50.7	55.6	56.3	55.3	55.3	56.7	49.9	50.0	55.6	49.6	43.2	49.7	

All vehicles

% of vehicles traveling at or less than



TABLE 12 SPEED DATA

Station 12 Highway SR 25 Location 0.7 mile S of Americus Weather Clear  
 No. of Lanes 2 Type of Surface Bituminous Last Previous Observation (Speed Report No. 72)  
 This Observation Date June 30, 1961 Date March 16, 1961  
 Time 1:40 - 3 PM Time 10 AM - 12:45 PM

PASSENGER CARS												TRUCKS			
OBSERVATION	All		Indiana		Non-Indiana		All		Less than 5000 pounds		5000 pounds or more				
	Last	Present	Last	Present	Last	Present	Last	Present	Last	Present	Last	Present			
No. of vehicles obs.	366	235	340	200	26	35	135	49	42	14	93	35			
Average speed (m.p.h.)	57.0	54.8	56.9	54.7	57.5	55.4	50.2	50.0	54.8	53.9	48.1	48.5			
Standard deviation		6.60								6.08		5.45			
24 m.p.h.															
29 m.p.h.															
34 m.p.h.															
39 m.p.h.															
44 m.p.h.															
49 m.p.h.	16.7	23.0	17.1	24.5	11.5	14.2	41.5	20.4	14.3		24.7	28.5			
54 m.p.h.	38.3	52.7	33.2	50.5	38.5	51.4	41.5	38.8	61.9	64.3	90.3	94.2			
59 m.p.h.	62.3	79.2	62.6	79.5	57.7	77.1	92.3	95.8	73.6	35.6	100.0	100.0			
64 m.p.h.	80.9	94.4	81.2	92.0	76.9	97.1	96.3	97.9	88.4	82.3					
69 m.p.h.	92.6	98.2	92.6	97.0	93.3	100.0	90.5	100.0	95.2	100.0					
74 m.p.h.	97.3	99.5	97.4	99.5	96.2		98.0		95.2						
79 m.p.h.															
84 m.p.h.															
89 m.p.h.															
No. of vehicles obs.	179	111	168	92	11	19	72	22	25	5	47	17			
Average speed	57.3	55.6	57.5	55.5	61.5	56.2	50.8	50.0	55.4	54.2	48.0	47.7			
No. of vehicles obs.	187	124	172	106	15	16	63	47	17	9	46	18			
Average speed	56.2	54.1	56.4	54.0	54.5	54.5	48.7	50.1	52.0	52.7	48.2	48.2			

All vehicles  
 at or less than





TABLE 13 SPEED DATA

Station 1, 2, 3, 4 Highway Interstate Location See individual stations

No. of Lanes 4 Type of Surface Weather  
 This Observation Date Last Previous Observation (Speed Report No.     )  
Date no previous study  
Time

PASSENGER CARS				TRUCKS											
OBSERVATION	All		Indiana		Non-Indiana		All		Less than 5000 pounds		5000 pounds or more				
	Last	Present	Last	Present	Last	Present	Last	Present	Last	Present	Last	Present			
No. of vehicles obs.		873		473		182		243		49		199			
Average speed (m.p.h.)		53.2		56.7		56.9		52.4		55.9		51.5			
Standard deviation		7.13		7.21		6.41		6.00		7.26		5.27			
24 m.p.h.		0													
29 m.p.h.		0.1		0											
34 m.p.h.		0.3		0.4		0		0		0		0			
39 m.p.h.		1.1		1.6		0.6		2.0		2.0		2.0			
44 m.p.h.		4.4		6.3		3.2		9.6		6.1		10.6			
49 m.p.h.		11.4		15.4		11.5		33.0		22.4		35.6			
54 m.p.h.		31.5		38.0		38.4		69.4		47.0		74.8			
59 m.p.h.		59.8		69.1		67.6		91.1		65.3		97.4			
64 m.p.h.		65.0		90.0		93.4		97.6		91.8		99.0			
69 m.p.h.		95.2		96.0		97.8		99.6		98.0		100.0			
74 m.p.h.		98.8		99.2		98.9		100.0		100.0					
79 m.p.h.		100.0		100.0		100.0									
84 m.p.h.															
89 m.p.h.															
No. of vehicles obs.															
Average speed															
No. of vehicles obs.															
Average speed															
All vehicles															
Bound															





TABLE 14 SPEED DATA

Station 5, 6, 7, 8 Highway 4 Lanes 4 Location See individual stations

No. of Lanes 4 Type of Surface Weather  
 Date 14 This Observation (Speed Report No.     )  
 Date      No previous study  
 Time     

PASSENGER CARS				TRUCKS			
OBSERVATION	All		Indiana		Non-Indiana		5000 pounds or more
	Last	Present	Last	Present	Last	Present	
No. of vehicles obs.		999		666		333	
Average speed (m.p.h.)		57.6		57.6		57.6	
Standard deviation		7.13		7.34		6.15	
24 m.p.h.							
29 m.p.h.							
34 m.p.h.		0.1		0.2			
39 m.p.h.		0.9		1.2		0.3	
44 m.p.h.		3.6		4.5		1.3	
49 m.p.h.		11.3		13.5		3.4	
54 m.p.h.		35.6		36.3		33.3	
59 m.p.h.		65.3		62.3		66.6	
64 m.p.h.		37.4		36.0		90.0	
69 m.p.h.		95.3		95.3		96.6	
74 m.p.h.		99.2		99.0		99.6	
79 m.p.h.		99.3		99.6		100.0	
84 m.p.h.		99.3		99.6			
89 m.p.h.		99.3		99.6			
No. of vehicles obs.							
Average speed							
No. of vehicles obs.							
Average speed							



TABLE 15		SPEED DATA	
1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24
25	26	27	28
29	30	31	32
33	34	35	36
37	38	39	40
41	42	43	44
45	46	47	48
49	50	51	52
53	54	55	56
57	58	59	60
61	62	63	64
65	66	67	68
69	70	71	72
73	74	75	76
77	78	79	80
81	82	83	84
85	86	87	88
89	90	91	92
93	94	95	96
97	98	99	100

Station 9, 10, 11, 12 Highway	2 Lanes	Location	See individual stations
No. of Lanes	<u>4</u>	Type of Surface	Weather
This Observation	Date	Last Previous Observation	(Speed Report No. )
	Time	Date	No previous study
		Time	

[illegible]



TABLE 16 SPEED DATA

Station 1 thru 12 Highway All Systems Location See individual stations

No. of Lanes      This Observation of Surface      Last Previous Observation (Speed Report No.     )  
 Date      Date       
 Time      Time     

PASSENGER CARS				TRUCKS			
OBSERVATION	All		Indiana		Non-Indiana		5000 pounds or more
	Last	Present	Last	Present	Last	Present	
No. of vehicles obs.		26.7		16.9		8.0	
Average speed (m.p.h.)		57.3		56.9		53.1	
Standard deviation		7.25		7.69		7.66	
24 m.p.h.		0.0					
29 m.p.h.		0.04		0.0		0.0	
34 m.p.h.		0.26		0.4		1.8	
39 m.p.h.		1.1		1.5		4.7	
44 m.p.h.		4.8		6.2		14.7	
49 m.p.h.		13.2		15.7		31.2	
54 m.p.h.		37.6		39.5		58.5	
59 m.p.h.		65.1		66.5		82.4	
64 m.p.h.		87.9		87.2		95.3	
69 m.p.h.		96.0		95.6		98.3	
74 m.p.h.		99.0		98.3		100.0	
79 m.p.h.		99.8		99.3			
84 m.p.h.		99.9		99.3			
89 m.p.h.		99.9		99.3			
No. of vehicles obs.							
Average speed							
No. of vehicles obs.							
Average speed							





TABLE 17

SUMMARY OF SPOT SPEED OBSERVATION  
ON INDIANA HIGHWAYS  
(Free-Moving Vehicles on Level, Tangent Sections)

		Passenger Cars				Trucks		
		Ind. Mean	Non-Ind. Mean	All Mean	All 59 per cent	Light Mean	Heavy Mean	All Mean
Two-Lane Highways								
May	'57	55.6	59.1	56.9	64.0	50.2	44.8	46.1
Aug.	'57	55.5	56.7	55.9	62.1	51.7	45.8	47.3
Aug.	'58	54.3	56.3	55.0	61.7	53.0	46.3	47.8
Mar.	'59	55.5	57.7	56.1	61.9	50.4	45.4	46.3
Aug.	'59	55.6	55.3	55.9	63.2	49.7	46.7	48.0
Mar.	'60	53.3	54.8	53.7	61.2	48.5	45.9	46.6
Sept.	'60	55.7	55.6	55.6	62.0	53.0	48.1	49.1
Mar.	'61	56.7	56.4	56.6	63.9	53.7	47.5	49.3
Aug.	'61	56.2	55.7	55.9	62.2	50.4	48.9	49.3
Four-Lane Highways								
May	'57	59.9	63.6	61.0	69.0	52.2	46.0	47.9
Aug.	'57	57.5	59.9	58.5	64.8	52.0	46.6	47.6
Aug.	'58	58.0	59.6	58.7	65.0	54.3	49.0	50.0
Mar.	'59	58.2	61.7	59.0	64.9	53.6	47.0	48.4
Aug.	'59	58.4	60.1	59.1	64.5	50.0	53.1	49.5
Mar.	'60	58.1	59.2	58.4	65.0	52.4	47.3	48.4
Sept.	'60	59.5	60.2	59.7	65.8	54.8	51.3	52.0
Mar.	'61	58.9	61.0	59.6	66.7	54.0	47.3	48.9
Aug.	'61	57.6	57.6	57.6	63.5	53.6	50.3	51.0
Interstate Highways								
Aug.	'61	56.7*	56.9*	58.2	64.0	55.9	51.5	52.4
All Highways								
May	'57	57.2	60.3	58.3	66.0	50.9	45.2	46.6
Aug.	'57	56.2	58.3	56.9	63.2	51.3	46.1	47.4
Aug.	'58	55.7	57.9	56.5	63.1	53.4	47.5	48.7
Mar.	'59	56.6	59.0	57.2	63.1	51.5	45.9	47.0
Aug.	'59	56.5	58.4	57.4	63.5	50.6	47.8	48.6
Mar.	'60	55.6	57.1	56.0	63.0	50.2	46.6	47.5
Sept.	'60	57.3	57.6	57.4	63.7	53.7	49.4	50.2
Mar.	'61	57.7	58.3	57.9	65.1	53.8	47.4	49.1
Aug.	'61	56.9	56.7	57.3	63.4	53.1	50.3	51.0

\*Includes data for only three of the four stations on Interstate Highways





Table 18. Analysis of Variance

Source	Degrees of freedom	Sum of Squares	Mean Square	F*value
Highway Type	2	4277	2138	46.5
Stations (in highway type)	9	8982	998	21.7
Vehicle type	2	25028	12512	272.0
Highway by Vehicle interaction	4	1396	349	7.6
Error	<u>3690</u> 3707	<u>168969</u> 208652	46	

\*An F value above 5.30 (2 and infinite degree of freedom) indicates significance at the 99.5% confidence level.





